RAILROAD GAZETTE

SATURDAY, AUGUST 30, 1873.

Grover's Spring Washer.

We give below sketches of a neat arrangement of steel spring washer, which has been designed and lately patented by Mr. J. W. Grover, of 9 Victoria Chambers, Westminster. The idea of this washer has apparently originated in the old "key-ring" washer, but instead of making the washer with a lap joint, as in this old pattern, Mr. Grover makes it of steel cut at the proper angle, and thus obtains a double cutting edge which holds the nut securely. In our engravings, fig. 1 shows a plan and elevation of one of Mr. Grover's flat washers with an open cut, and fig. 2 similar views of a washer with a closed-up cut, the dotted lines in the latter instance showing the form of the washer when expanded by the pressure of the nut coming upon it. Fig. 3 shows a washer of round iron, while figs. 4 and 5 represent the washer as applied.

FIG. 1

FIG. 3

FIG. 2

The washer is made of shear steel coiled round a mandrel, as represented in fig. 6, and then cut at a suitable angle, as shown. The steel being then spring tempered, a spring washer with a double-cutting edge is obtained at a very moderate cost.

FIG. 4.

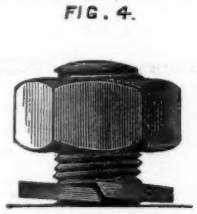


FIG. 5

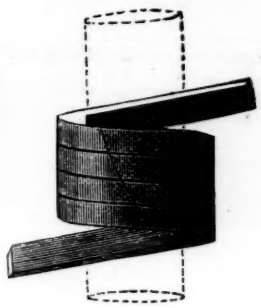


FIG. 6

Mr. Grover's washers have already been tested on fish-plate bolts on two of the main lines to London, both subjected to very heavy traffic, and in each case we understand the results to have been most satisfactory, the nuts being held quite securely, even if only screwed up by hand without a spanner. To take the nuts off a long spanner is requisite. The number of situations in which a simple means of locking nuts can be advantageously used is so great that we expect Mr. Grover will find a large demand for his washers.—*Engineering.*

Technical Regulations of the Union of German Railroad Managements.

There is in Germany an association called the "Union of German Railroad Administrations," apparently similar in nature to what the "Railway Association of America" was designed to be. In June, 1871, the engineers of the Union held their fifth meeting in Hamburg, and there came to certain decisions concerning the construction of roads and rolling stock and the working of trains for the lines of the Union. A "Technical Committee" compiled a small volume of "Technical Regulations" based on these decisions, which we may doubtless accept as the best fruit of German experience on these matters, as nearly all the German lines are included in the Union, and no attempt seems to have been made to establish rigid rules (except where uniformity was indispensable for the safe working of the lines as a system), but only to fix the limits of variations in practice.

Concerning the origin of the work and its value, Mr. C. Wehrenpfennig, Chief of the Technical Bureau of the Grand Central Belgian Railroad, who translated it into French, says:

"These regulations are not the work of a few authorities, but rather the product of the experience of all the special services. In no country have railroads been, in the beginning, more various than in Germany; and the uniformity which they have finally attained has been the result of ripe reflection rather than that of imitation.

"This remarkable work, a veritable technical railroad catechism, gives in a concise form the bases which it would be desirable to see adopted by all railroads on the Continent, in the interest of international traffic."

Only part of these regulations are obligatory. The paragraphs belonging to this class are marked with an asterisk (*).

We give this week a translation of the sections relating to the construction of the road and road-bed and those concerning locomotives and tenders. There is an intervening portion relating to the arrangement of stations, which we may give hereafter, as also the following sections on coaches and cars, general rules for rolling stock, movement of trains and signals. While these rules may, in many cases, be inapplicable to America, we believe that most of them will be found suggestive, and many of great value as indicating the standards of safety adopted by an exceptionally careful nation, whose experience in railroad construction and working has, doubtless, been more carefully recorded and studied than that of any other nation except, perhaps, France, which has had much more uniformity from the beginning, and has thus not had so great a variety of experiences to learn from.

The weights and measures in the original were of the metrical system, and these we have reduced to our measures, which will account for the frequent fractions and lack of round numbers.

GENERAL RULES FOR THE CONSTRUCTION OF RAILROADS OF THE FIRST CLASS.

CONSTRUCTION OF THE ROAD PROPER.

§ 1. *Road-bed.*—Every project for a first-class railroad should be so designed that two tracks can be established should it become necessary.

§ 2. *Grades.*—The maximum grade should be as a general rule:

In level country	1 to 200 (26.4 feet per mile)
In hilly country	1 to 100 (52.8 " " ")
In mountainous country	1 to 40 (132 " " ")

Changes of grade should be connected by arcs of the greatest possible radius in order to moderate the transitions.

Between down grades and up grades of as much as 1 to 200 there should be whenever possible a level section of the length of a freight train.

§ 3. The radius of curves should not be less than 3,609 feet in level country, 1,969 feet in hilly country and 984 feet in mountainous country.

* Radii of less than 590 feet are prohibited.

The connection of a tangent with curve should be made on a parabola.

Between two curves in opposite directions there should be a tangent at least 164 feet long. On steep grades it is necessary to use curves with the greatest radius possible, and so far as possible make changes of gauge only on tangents.

*§ 4. *Gauge.*—The distance between the inner edges of the rails shall be 4 feet 8½ inches (1.435 metres).

*§ 5. *Widening Gauge.*—On curves of a radius less than 3,281 feet, the distance between the rails should be increased in inverse ratio with the radii of the curves. This increase, however, should not exceed 1.18 inches (.03 metre), even for a radius of 590 feet.

*§ 6. *Normal Profile of Clear Passage.*—On the open road and within yards the clear space over the tracks passed over by trains should be at least that of the normal profile of passage indicated by fig. 1.*a*

On curves, attention should be paid to the widening of the gauge and the elevation of the outer rail.

For new constructions it is advisable to reduce the height of the third salient in the normal profile from 4 feet ¼ inch to 3 feet 8¼ inches.

§ 7. *Distance between Tracks.*—For double-track railroads, the distance from center to center of the two tracks should not be less than 11 feet 5¾ inches (3.5 metres) outside of stations and yards.

If one or two tracks are laid parallel to this double track, the distance from center line to center line between the old road and the new should be at least 13 feet 1½ inches (4 metres).

In new constructions it is advisable to have a distance of 13 feet 1½ inches between all tracks, conformably to the normal profile of free passage.

§ 8. *Width of Formation Level.*—The width of the formation level should be at least 6 feet 6¾ inches (2 metres) from the crest of the slope to the center line of the nearest track.

§ 9. *Drainage of Roads.*—The road-bed should be drained in such a way as to prevent the action of the hardest frosts reaching the highest level of water.

The profile under the ballast should, in all cases, permit the complete escape of water down the sides of the road-bed.

It is advisable to construct the road-bed outside of the rails entirely of permeable materials.

§ 10. *Ballast.*—The ballast should have a thickness of at least 8 inches (0.2 metre), as well under the cross-ties as under stone sleepers.

It should not be liable to be moved by the action of moisture, nor to be attacked by frost.

§ 11. *Rails.*—The rails shall be of iron or of rolled steel. As a general rule they shall have a minimum length of 19 feet 8¼ inches (6 metres).

a This "normal profile" is 7ft. 6in. wide on the level of the rail tops, with spaces for the flanges, for a height of 9 inches; above that 9 feet wide for a height of 6 inches; thence 10ft 10in. wide for a height of 15 inches on "the open road" and of 33 inches in stations; thence 13ft. 1½in to a point 10 feet above the surface of the rails; thence inclining inward to a point 5 feet from the center line at a height of 12ft. 9in., and thence inclining at a greater angle to the top, which is 5 feet wide and 15ft. 9in. above the surface of the rails.

§ 12. The head of the rail should have a width of at least 2¼ inches; it must present a rounded or a flat face, in the former case, rounded with a minimum radius of 656 feet.*a*

§ 13. Rails shall be cut at their ends in a plane normal to their axis.

§ 14. It is advisable to give rails a height of at least 5¼ inches (0.13 metre).

§ 15. The rails should be capable of supporting with safety 15,435 pounds (7,000 kilogrammes) per wheel.

§ 16. *Position of Rails.*—The rails should be inclined toward the inside of the track; this inclination should be at least 1 in 20.

* § 17. The upper edges of the two lines of rails should be of exactly the same height on tangents.

* On curves the outside rail should be placed higher than the inside rail, taking account of the rapidity of movement over them, and in such manner that the side of the head of the rail on the inside may be exposed as little as possible to wear by friction with flanges of the tires.

* § 18. *Rail Attachments.*—On the inside of the rails of a road all means of fastening, such as chairs, bolts, spikes, etc., should be at least 1½ inches below the top of the rail-head.

§ 19. *Rail Joints.*—On a tangent, the joints of the two lines of rails should be placed opposite each other, following a straight line normal to the center line of the road. On curves, the joints may be alternate.

§ 20. The fastening of the ends must leave the play necessary for the expansion and contraction due to changes of temperature.

* § 21. The joining of rails at the ends with simple hook-spikes or wood screws is forbidden for principal tracks.

§ 22. The fish-joint with four bolts is recognized as the best system of connecting the ends of rails.

§ 23. It is advisable to employ fish-joints also for connecting chair rails (I rails).

§ 24. If the fishing is solid, it is advisable to place the joints between the ties or sleepers.

The ties next to the ends should be placed as close as a perfect tamping will permit.

On curves of a radius of less than 2,625 feet, it is advisable to use iron seat plates for the outside line of rails.

§ 25. *Rail Supports.*—For rail supports, wood, stone and iron may be used.

§ 26. *Wooden Sleepers.*—The best supports used up to this time are wooden sleepers impregnated with a substance which preserves them from decay.

§ 27. When wooden sleepers are used, the system of cross-ties is, confessedly, preferable to that of longitudinal sleepers.

§ 28. When cross-ties are used, those which are under the ends of the rails should present a larger base than the intervening ties.

§ 29. If longitudinal sleepers are used, they should be tied together at their extremities in such a way that the distance between them cannot be changed.

§ 30. *Stone Sleepers.*—Stone sleepers are admissible in new railroads only when they are set in the natural soil.

§ 31. Stone sleepers should not be used on embankments, except when the latter are completely settled and consolidated.

§ 32. On curves of a radius less than 2,625 feet, on a track with stone sleepers, the rails should be tied together at the joints and in the middle, so as to make any variation in gauge impossible. On curves of greater radii and on tangents, this tying of the rails may be omitted if the blocks of stone employed have a sufficient weight, if they maintain the inclination of the rails well, and if they are well tamped with ballast on the outer side.

§ 33. *Roads wholly of Iron.*—When the system of roads wholly of iron is employed, there is equal need of resorting to special methods for maintaining the gauge of the rails, especially on curves.

§ 34. *Guard Rails.*—It is not necessary to place guard rails at grade crossings.

*§ 35. It is only at grade crossings, on sidings, and at stations that guard rails may be laid.

Safety timbers and rails, if their employment is considered indispensable, should be placed outside of the normal profile.

§ 36. *Masonry Bridges.*—For bridges, a solid arch of stone or good brick should be preferred to any other structure, if the special circumstances do not make an iron structure more advantageous.

§ 37. *Wooden and Iron Bridges.*—Wooden bridges should be employed only in exceptional cases.

For iron or steel bridges, the parts under strain should be of rolled or forged materials. A test of the bridge under load is necessary.

§ 38. *Grade Crossings.*—The angle with the track of crossings on a level with the rails should not be, as a general rule, less than 30 degrees.

§ 39. Highway crossings at grade should be nearly level for such a distance that the vehicles will be upon a nearly level surface before the draught animals reach the rails.

§ 40. The filling of the space between the rails should not be heaped up.

*§ 41. *Flange Channels.*—At grade crossings on a road of normal gauge, the profile of passage for the flange of the tires should have a width of at least 2¾ inches and a depth of at least 1½ inches.

* On level crossings upon a track whose gauge is widened, the channel of 2¾ inches should be enlarged in proportion to the widening of the track.

§ 42. The flange channel should be made in such a way that draught animals which pass cannot catch their shoes in it.

§ 43. *Fencing.*—Inclosures should be established where the ordinary surveillance of the road is not sufficient to prevent persons and animals from getting upon the track.

Between the track and such roads as may chance to run

a 200 metres in the French translation.

alongside of it on the same or higher level, it is necessary to have an embankment. A ditch with one of its banks raised is sufficient.

§ 44. *Crossing Gates.*—Grade crossings should be provided with solid and apparent gates.

§ 45. *Distance Gates.*—Gates operated at a distance by wires may be employed for closing grade crossings of roads which are not much frequented.

§ 46. The watchmen who serve these gates should not be at a distance greater than 2,625 feet from these crossings; these gates should be within their sight; or, indeed, they should be able to manage them in another way.

§ 47. Gates worked at a distance should be provided with a bell.

Gates worked at a distance should be capable of being operated by hand upon the spot; the arrangement should be such that a vehicle shut in upon the track may disengage itself in case of need.

§ 48. *Mile Posts.*—The road should be provided, at fixed intervals, with mile posts.

§ 49. *Grade Indicators.*—Every change of grade should be marked by a grade indicator.

§ 50. *Protection from Snow.*—To avoid the blocking of the tracks by snow, carried on by winds or avalanches, the most elaborate precautions must be taken from the very construction of the road.

§ 51. *Fire Belts.*—In forests, in order to avoid fires, a belt of ground must be left bare alongside the road, or so utilized that fire cannot catch on it. The width of this belt is to be determined according to the peculiarities of the ground.

Trees should be cut down, which, should they happen to fall, might obstruct the track.

LOCOMOTIVES.

§ 103. *Height and Width.*—The width of locomotives must in no place exceed 3.05 metres (10 feet).

The lowest part must not extend to a distance less than .13 metre (5.1 inches) above the level of the rails. The height of the smoke-stack above the level of the rails may not be more than 4.57 metres (15 feet). All of the dimensions must permit a play of 2 inches in the normal profile for free passage.

§ 104. *Distance between Axles.*—The distance between the axles of locomotives should be as great as the alignment of the road permits.

However, for lines which have on the open road (between stations) many curves, it is advisable not to exceed as a maximum, a distance of

3	metres	(9 ft. 10 in.)..	for curves of.....	820	feet radius.
3.4	"	(11 ft. 2 in.)..	" "	984	" "
3.8	"	(12 ft. 5⅝ in.)..	" "	1,148	" "
4.2	"	(13 ft. 9½ in.)..	" "	1,312	" "
4.6	"	(15 ft. 1¼ in)..	" "	1 476	" "
5.0	"	(16 ft. 5 in)..	" "	1.640	" "
5.4	"	(17 ft. 8¾ in.)..	" "	1.805	" "
5.8	"	(19 ft. ½ in.)..	" "	1,969	" "
6 0	"	(19 ft. 8½ in.)..	" " more than.	1,969	" "

§ 105. *Movable Axles.*—When on the open road *a* there are curves of less than 250 metres (about 820 feet) radius, it is advisable to use trucks or axles with side-play.

§ 106. *Weight.*—The load per axle should not exceed 14 tons, including the weight of the axle and the wheels.

§ 107. *Division of the Weight.*—For the proper division of the weight, it is especially important to put a suitable load upon the leading axle (for passenger locomotives with three axles at least one-fourth of the weight of the engine). The trailing axle of a locomotive with three axles, if it is an axle carrying load, ought to support not less than one-fifth of the total weight. The load should be divided uniformly upon coupled axles.

§ 108. *Suspension.*—The suspension considered the best is that made by means of equalizing bars upon three points of support.

§ 109. *Boiler.*—The boiler of a locomotive should be placed as low as possible.

§ 110. *Construction of the Boiler.*—The barrel of the boiler should be circular, and the plates should be placed so that the direction of the lamination may form a right angle with the axis of the boiler. The joints of the plates parallel to the axis of the boiler should be fastened by means of a double riveting. These joints ought not to be on the lower part of the boiler.

The free expansion of the boiler under the action of heat must be secured.

§ 111. *Fastening to the Fire-box.*—A part of the crown bars should be suspended to the outside of the boiler. Stay bolts may be employed for supporting the crown of the fire-box. When screw stay bolts are used, they should be drilled wholly or in part; it is a good means of ascertaining defects.

§ 112. *Steam Pressure.*—Experience has demonstrated that the pressure of steam can be carried up to ten atmospheres with advantage.

§ 113. *Boiler Shell.*—The shell of the boiler should suffer no permanent alteration of form when submitted to hydraulic pressure equal to one and a half times that to which the engine will be limited.

* § 114. *Safety Valves.*—Each locomotive should be provided with at least two safety valves, one of which shall be so arranged that it cannot be made to carry more than the maximum pressure determined upon.

The valves should be so loaded that the valve may have vertical movement of .003 metres (about ⅛ inch).

* § 115. *Steam Gauge.*—In order to be able to observe the variations of pressure in the boiler, a steam gauge as perfect as possible should be placed on each locomotive.

* § 116. *Water Gauge.*—The boiler should have a water gauge and three try-cocks.

The lower cock will be placed 0.1 metre (4 inches) above the top of the fire-box.

* § 117. *Feed-water Apparatus.*—The boiler must be supplied with at least two feed-water apparatus, independent of each other, one of which at least must work without the aid of the movement of the engine.

§ 118. *Heating Pipes.*—Every locomotive should be provided with at least one heating pipe in communication with the suction pipes of the feed-water apparatus, connecting the tender with the latter.

* § 119. *Steam Whistle.*—The locomotive should be provided with a powerful steam whistle.

* § 120. *Ash-pan.*—Below the fire-box there should be an ash-pan, well closed, the front of which, and if necessary the rear, should be provided with a damper which can be operated by the engineman.

* § 121. *Spark Arresters.*—Each locomotive should be provided with an apparatus for arresting sparks, which should be adapted to the nature of the fuel.

* § 122. *Track-clearers.*—In front of its two front wheels every locomotive should be provided with strong track-clearers, placed exactly above the rails and .05 to .06 metre (2 to 2½ inches) distant from them.

§ 123. *Signal Supports.*—On the front of every locomotive there should be supports for at least two disks (for signals).

§ 124. *Cabs.*—The use of shelters for the protection of the engineman and fireman is recommended.

* § 125. *Couplings.*—The front bunter-beams of the locomotives should be provided with two elastic bunters and one solid draw hook having the dimensions prescribed for freight cars.

§ 126. For connecting the engine to the tender there must be, independently of a solid coupling-rod, two coupling-chains, which come into use only in case the principal attachment should fail.

TENDERS.

* § 127. *Dimensions.*—The height of the water-tank above the rails may reach 2.75 metres (9 feet). The width of the tender must not exceed 10 feet, including the steps and other projecting parts. All the other dimensions must be within the limits prescribed for locomotives.

§ 128. *Distance Between Axles.*—Concerning the distance between axles, the rules given for locomotives should be followed. For tenders with three axles, equalizing bars should be used in order to adjust their loads.

§ 129. *Water Tank.*—The water tanks should be fastened to the frames in such a manner that a violent shock cannot detach them.

* § 130. *Brakes.*—Tenders (as also tank locomotives) should be provided with a powerful brake.

§ 131. *Signals.*—On the rear of the tender there should be signal carriers to carry the disks which are used on the front of the engine.

§ 132. *Couplings.*—The rear cross-beam of the tender should be provided with two elastic bunters, one solid hook with elastic fastening, and a coupling conformable to the system prescribed for freight cars.

a This expression indicates the main line between stations and sidings; generally, that part of the track over which trains run at full speed.—THE TRANSLATOR.

An Electric Clock.

The Harrisburg (Pa.) *State Journal*, of August 14, says:

"A large electric clock was recently placed in the Superintendent's office of the Pennsylvania passenger depot in this city, by the firm of Hahl & Kiefer, successors of the American Electric Clock and Bell Company of Washington, D. C. Attached to the main clock or regulator are three subordinate ones—two in the office of that building, while the third is placed in the master mechanic's office at the Pennsylvania Company's shops, a mile distant from the regulator. These clocks stood the severe test of Tuesday night, notwithstanding the large amount of electricity in the atmosphere—they having kept accurate time. Should the experiment be successful, of which there is but little doubt, four more subordinates will be attached—one at the shops, one in the Cumberland Valley Railroad office and two in the reception rooms of the Pennsylvania Railroad. Neither of the four clocks need to be touched after first regulating them, the batteries of course being kept in good condition, for six months. Lightning arresters are placed on the wires at the outside, making the clocks secure from any damage, even though the wires be struck."

—Mr. George B. Nichols, Superintendent of the Galveston, Houston & Henderson Railroad, was presented with a horse and buggy valued at $1,200 recently by the employees of the road. The presentation took place at Galveston, Tex., Aug. 16.

Contributions.

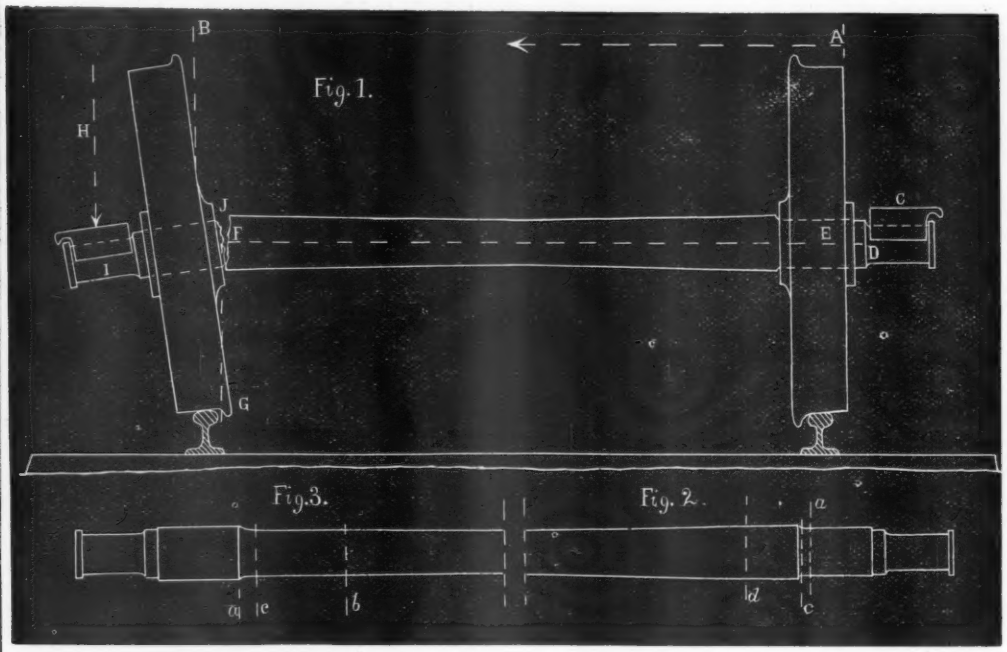
Forms of Car Axles.

OIL CITY, June 12, 1873.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In looking over your editorial in the last number of the GAZETTE on car axles and their defects, the thought occurred, What is the real cause of axles breaking inside of the wheel hub? As I am not a car-builder, neither a railroad official, I only give my views (as a railroad man) on this important subject, which will be more readily understood by reference to the cuts. I intend, first, to blame the present shape of car axles and the way they are fitted up; next, the condition of the road. In turning axles, I also condemn a "shoulder," be it a sharp one or a round one; in fact I condemn a shoulder of any kind, for the very reason that in ninety-nine cases out of a hundred an iron shaft will break at a shoulder, everything else considered. Car wheels, as a general thing, cannot be pressed up to a shoulder and have flanges all come to the gauge, unless the hubs are faced off on the inside to a standard, and we know this is not always done. In most railroad shops the axle is turned so that when the wheels are pressed on there is a space of from one-quarter to a half inch between the shoulder and the hub (sometimes more). In riding over a rough track we always experience a surging motion of the cars, as though the car was striking against some solid body; so it is, and this solid body is the shoulder on the journal on one side, and the wheel flange against the rail on the other side. Let us follow this sudden jar and see the result. In fig. 1 the car has surged from *A* to *B*, the brass *C* is tight against the shoulder *D*; the shock has passed through the dotted line from *E* to *F* and from *F* to *G*. This force, assisted by the downward pressure *H* (of the car) on the journal *I*, has caused the axle to break at *J*. I have known cases where, in unloading wheels and axles from a car (the wheels were dropped from the car to the track), when one wheel struck first the axle snapped off (inside the hub) like pipe clay. This is only another way of illustrating my theory, in regard to axles breaking at this particular point. I believe that the present axles are heavy enough at the wheel "fit," but are weakened by too much turning; in fact the best part of an axle is taken off in the lathe. Fig. 2 shows the present type of axle turned ready for the wheel, which is pressed on to the point *a*. In axles of this kind there is no "spring" or "give" between the points *c* and *d*, and as a consequence it is generally a *break*. In fig. 3 I suggest a form of axle which I believe to be stronger and lighter than the other, for the reason that it is only turned up to *a*, consequently we get the strength of the hammered surface from *a* to *b*, and should an unusual strain (as shown in fig. 1) be brought on an axle of this kind, it will *bend* at *c* or thereabouts, which is always better than a break. I only offer these as "theories" which actual experiment might explode.

W. DE SANNO.



The Bridge at LaCrosse—The Origin and Character of the Opposition the Milwaukee & St. Paul Railway Company.

TO THE EDITOR OF THE RAILROAD GAZETTE:

To those not well acquainted with the facts and circumstances connected with the attempt of the Milwaukee & St. Paul Railway Company to build a bridge at LaCrosse, the subject is involved in some obscurity. The Secretary of War is understood to be opposed to the location of the Company, and has sought to disapprove of and prevent it. The Attorney-General has given an opinion that the Secretary of War has no more right to locate the bridge than he has to build it; but if the location is found to be an *obstruction to navigation*, he may disapprove of it.

No such fact having been found by any of the engineers who have reported upon it, it seems, according to the opinion of the Attorney-General, that the approval of the Secretary of War "is due."

Now for the origin of this great and really formidable oppo-

sition. That it originated in a desire of the city of LaCrosse to force the through travel between St. Paul and Chicago to pass through the centre of South La Crosse, and not in any care for the interest of navigation, is plain for the following facts:

Two *distinct* charters have been granted by Congress for bridges between the counties of La Crosse, Wis., and Houston, Minn., the first in 1868, to the Southern Minnesota Railroad, and the second April 1, 1872, to the Milwaukee & St. Paul Railway.

General Rusk, in a letter to the Mayor of La Crosse, May 4, 1872, says that the granting of the second charter was satisfactory to the President of the Southern Minnesota Railroad so long as it did not repeal his charter, and that there was no opposition to it, although public attention had twice been called to it in the La Crosse papers.

He also says: "If the bridge is not to be built where *it is wanted*, an appeal can be taken to the Secretary of War, who will no doubt hold that two bridges would be an obstruction to navigation," and that "he could get further legislation if necessary." He also immediately asked the Secretary of War to appoint a board of engineers. The Secretary noted on the letter that General Rusk wishes to be heard before a final decision is made, and refers the letter to the Chief of Engineers.

Major Casey, in the absence of the Chief of Engineers, on the 8th of May replies to the Secretary that he recommends the appointment of Colonel McComb, Major Weitzel and Major Merrill as a board of engineers.

On the 24th of May the bill to *further regulate* bridges on the Mississippi River was reported to the House by the Committee on Commerce, and, in the absence of Mr. Mitchell, passed its three readings in one day. It was represented as a general law, but General Rusk says that he and Judge Howe drew it up with *special reference to the bridge at La Crosse*; that he showed it to the Engineer Department, who thought it was *sufficient*. Judge Howe engineered it through the Senate in one or two days. It was approved June 4. The arrangements between General Rusk, the Engineer Department and the Secretary of War were now complete. On the 8th of June, the Chief of Engineers sends the map of the location of the Milwaukee & St. Paul Company, which had been filed with the Secretary of War on the 20th of May, and all the papers relating to the matter, including numerous letters from General Rusk to General G. K. Warren, Newport, R. I., who had made extensive surveys of the Mississippi River with reference to the proposed bridges, and called on him for a general report on the subject of bridges at La Crosse.

General Warren, in his report dated Newport, R. I., June 30, 1872, drawn up at a place entirely removed from any influence of La Crosse or the railway company, and not affected by any of the political or local influences which have appeared so conspicuous in the action of the Secretary of War, states that the location of the St. Paul Company will not interfere with navigation, and he suggests to the Secretary that it is not a question of engineering obstruction to navigation, but whether the wishes of La Crosse will justify him in compelling the St. Paul Company to change their location for the benefit of the city.

Had the Secretary acted according to that report, all trouble would have been at an end and the bridge now completed; but that would not have served his friend Rusk; so he must try and get a different report. The three eminent engineers who had been nominated two months before were now duly appointed. The report of General Warren was placed in their hands. They visited La Crosse. They know the circumstances of their appointment. They were agreeably entertained by the city. They saw the great importance of a highway and railway bridge combined. They believed that Congress intended to require that all bridges hereafter built across the Mississippi River, under the authority of any act of Congress, should be built as highway bridges. They believed that there ought to be only one bridge near La Crosse, and that that should accommodate all railways, *except that of the company proposing to build it*.

An opinion of the Attorney-General was given soon after, to the effect that a highway bridge was not "*required*" at that place.

The Board was then sent back to review its proceedings. They then saw more clearly than before the wants of all *future railroads*, and concluded that a due regard to *them* required them to adhere to their former report.

The Attorney-General has since that time given an opinion that they only had a right to consider the wants of those roads that desire to cross that particular bridge.

The Secretary of War has not deemed it best to send the Board back a second time, although he has refused the request of the company to appoint a new board.

His action has been constantly regarded by the company as not sustained by law, and protest has been made at various steps with little avail.

When he at length referred the principal questions in the case to the Attorney-General, and his opinion of 16th May sustaining the company was promulgated, it was the occasion of a *severe chill* at La Crosse. General Rusk was sent for, and he, with a La Crosse attorney, rushed to Washington, whence he commenced sending a series of encouraging telegrams to his La Crosse friends as to what the Secretary of War would do; and, verily, the Secretary of War has done just what General Rusk said he would, every time.

The city of La Crosse has been in a fever of excitement for months. The newspapers of that place have teemed with inflammatory appeals to its citizens, with scurrilous attacks upon the Milwaukee & St. Paul Company, its officers and agents, and with gross misstatements of fact. They have constantly alleged that the company was going to destroy the navigation of the river; that the small amount of rip-rap placed by the company in La Crosse Slough, to prevent its enlarging, was maliciously designed to turn the main channel away from that city. They have invoked the interference of the Secretary of War, who sent an engineer officer to make an examination of those terrible obstructions.

The Governor of Wisconsin, lately a resident of La Crosse, has also taken a deep interest in the matter.

But while they have made such herculean efforts "*to preserve the navigation of the river*," the owners of steamboats have not taken any interest in the matter. Not one of them has made a trip to Washington. They have even gone so far as to express a preference for the company's location over that of the Secretary of War, on the ground that a bridge is less of an obstruction above a town than at or below it. The only apparent exception to this statement is the case of Capt. P. S. Davidson, of *La Crosse*, who may, perhaps, be a stockholder in a packet company, and whose statement has made such a great figure in all the arguments of General Rusk and of the attorneys of La Crosse. Privately he has admitted that when he signed his famous statement he thought the location different from what it is, and therefore his statement is not applicable to the case.

As my own opinions and conclusions about the location were formed months before the people of La Crosse manifested any interest in the matter, I have never been able to understand the intense spite which followed the amiable demeanor of those who sought to instruct me as to the interests of the company and of the public.

The present state of the case is this: The railway company, relying upon the law and upon the opinion of the Attorney-General construing it, in July commenced work in the river. An injunction was immediately applied for in the United States Circuit Court for the Western District of Wisconsin. The company immediately suspended work in the river and asked a postponement of a trial of the cause until the September term of the Court.

Meantime, other work not prevented by the injunction is progressing, and it is hoped that all obstacles arising from local opposition will be overcome, so that this important outlet for the State of Minnesota may be open for business by the opening of navigation next spring. J. T. DODGE.

August 22, 1873.

Correction of July Report of Train Accidents.

ST. PAUL & SIOUX CITY AND SIOUX CITY & ST. PAUL RAILROADS.

SIOUX CITY, Iowa, August 21, 1873.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the list of Train Accidents in July, published in the GAZETTE of the 16th inst., it is stated that in an accident to a gravel train on our road, on the 8th, near Hersey, Minn., "there were 47 men in the caboose, 42 of whom were more or less injured, some of them severely."

This statement is incorrect; there were only 32 men on the train, only three of whom were injured, and none seriously. Two of the three who were injured were ready for work again in a couple of days after the accident.

Yours, truly. T. B. BURNETT, Asst. Supt.

[We are much obliged to Mr. Burnett for his correction, the more so as it makes an important change for the better in the report for the month. Our apology for this (and doubtless other) mistakes is that we found it so in print, and that was the only information we had. Loose statements and typographical errors we are frequently able to correct by a comparison of reports in different newspapers; but in this case we found but one report, which of itself caused us to suspect the accuracy of the description of an accident reported to be so serious.—EDITOR RAILROAD GAZETTE.]

The Baldwin Locomotive Works.

In 1832 only 20 hands were employed, and one engine required a year to build. At this time there are about 3,000 skilled mechanics employed, and the present firm are turning out an average of 1⅔ engines per day. From a single, narrow, contracted shop, where a hammer could scarcely be slung aloft without striking the wall, the works now cover 8 acres and ¼, and from a pay roll of $200 per week it has grown to $40,000 per week, or over two million dollars per year. In order to show the enormous extent of the work done in all these years it may be stated that there have been built, of all sizes and kinds, 3,342 engines, the lowest selling for $3,500 and the highest for $34,000. Averaging these engines at about $12,000 each, it will be seen that this one concern has manufactured within forty years engines to the value of $41,104,000, or over $1,000,000 work per year. During these years the firm have paid out for labor alone about $15,000,000, and some of the employees have seen the full forty years of service with the firm. One, Mr Lewis O. Howell, who forged the iron for the first engine, is still a foreman, a hale and hearty man of 71 years, who looks as though he were equal to another quarter of a century. As showing the imperfections of the early engines made, this gentleman states that a large party of celebrities who made a trial trip over the old State road on the third engine built, had large holes burnt in their clothing by the sparks from the engine, there being no "spark arrester" known then. To further exhibit the increase of demand for the latter perfected engines, it is stated that in 1866 there were 118 engines built, 127 in 1867, 124 in 1868, 235 in 1869, 280 in 1870, 331 in 1871, 422 in 1872, and the number for 1873 will exceed 500.

The 1,000th engine was furnished in February, 1861, the 2,000th on October 30, 1869, and the 3,000th November 13, 1872, and the last one completed up to this writing numbered 3,342, on July 18. It is stated that one other immense firm in Berlin has turned out over 3,000, having on exhibition their 3,000th locomotive at the Vienna Exhibition; but this firm employs ten thousand men to do less work and at greater cost in the same time than the Baldwin works, thus proving conclusively the superiority in skill, the perfection in machinery, and even Europe itself acknowledges the superiority in perfection of the American built engine.

The Baldwin works cover over an area of 8¾ acres, or nearly 4 squares, the real estate possessions amounting in the aggregate to about $1,400,000, of which about $125,000 is in buildings. The works front on Broad street, from Pennsylvania avenue to Spring Garden street, 760 feet, looking like a busy city all to itself. The several lots occupied by the works have a superficial ground area, all told, of about 400,000 square feet, and upon them are erected substantial brick structures, one, two, three and four stories high, filled with the most perfect and expensive machinery.

The following table will show the number of shops, the area of each, the purposes for which they are used, the number of men employed in each and the number of machines:

No.	Buildings.	Area in square feet.	Number employed.	Machines.
1.	Frame shop	18 463	99	55
2.	Connecting rod shop	19,213	124	63
3.	Wood pattern shop	19,2 3	125	30
4.	Steam hammer shop	28,100	190	15
5.	Office buildings	2,166	19	..
6.	Store room	1,400	14	..
7.	Wheel department	10 280	63	70
8.	Smith and boiler shop	56 167	486	45
9.	Drawing room	2,166	18	..
10.	Standard gauge shop	1,6 0	13	10
11.	Piston and guide shop	14,486	86	68
12.	Valve motion shop	10,216	115	43
13.	Erecting shop	23 809	285	30
14.	Grinding room	4 148	10	9
15.	Pipe shop	4,148	28	5
16.	Sheet iron shop	6,8 0	32	5
17.	Paint shop	8,.96	19	5
18.	Machine repair shop	6,8 0	46	21
19.	Brass work shop	6,8 0	34	35
20.	Brass foundry	2,800	17	..
21.	Tool repair shop	6 800	12	9
22.	Pattern loft	6,800	7	..
23.	Iron foundry	18 000	265	38
24.	Smith shop	16,100	146	6
25.	Forge shop	9,600	119	10
26.	Spring shop	10 004	36	18
27.	Tender paint shop	9,790	10	..
28.	Truck wheel shop	13 706	89	27
29.	Tank shops	9,790	62	21
30.	Stack shops	9,790	28	12
31.	Tender frame shop	9,790	35	44
32.	Punching and shearing shop	4 800	14	5
33.	Blacksmith shop	1,700	6	..
34.	Smith shop (No. 2)	8,140	16	4
35.	Stables	7,000	27	..
	Total	390,482	2,703	703

In addition to the above, there are 18 stationary engines, 26 boilers and 115 laboring men are not enumerated, while a force of over 200 more are given employment at times, increasing the entire force to over 3,000 persons.

The consumption of material in the works is of course enormous, and to give some idea figures are again resorted to. The average annual consumption of the principal articles used is as follows:

Coal used	18 0 0 tons.
Bar iron	3,000 "
Pig iron	5,800 "
Boiler iron	1 150 "
Boiler plate steel	420 "
Copper	384,0 0 lbs.
Spring steel	350, 0 "
Lead	100 000 "
Pig tin	15,000 "
Spelter	42,0.0 "
Coke	40 0 0 bush.
Charcoal	5 6 0 bbls.
Steel tires	2,100
Chilled wheels	5 000
Flues	55,000

As a matter of course, the larger number of the engines manufactured are sold and used in the United States; but there have been a great many sent to foreign countries. An investigation goes to prove that since the year 1860 the firm have sent abroad 154 engines, as follows: To Canada, 39; to Cuba, 25; to Brazil, 50; to Peru, 13; to Russia, 10; to Finland, 9; to Nova Scotia, 4, and to New Brunswick, 4. There are now being constructed 50 for Canada, 11 for South America, and several smaller orders for other countries. Mr. Baldwin, the founder, died in 1866, after a long life of usefulness, and, after many changes, Mr M. Baird, a former apprentice in the business, became a prominent member in the firm. A few months since the latter gentleman also retired, disposing of his interest in the business, amounting to one-third, for $1,125,000. The present firm is composed almost entirely of young men, who have grown up with the business, from office or apprentice boys. Mr. George Burnham, the senior, who has been in the concern for 35 years, is the financier. Mr. Charles T. Parry, another member, is general manager. He is now abroad in Europe on a business tour. Dr. Edward H. Williams, an experienced railroad official, is now the selling, or contracting partner. Mr. Wm. P. Henszey is the mechanical engineer. Mr. Edward Longstreth, a former apprentice, who was made a foreman before he was free, is now a partner, and General Superintendent. Mr. John H. Converse is an old journalist.

Some of the machines used in the establishment are well worth notice. One steam hammer has a weight of over 3,000 pounds. * * * Another, a tram engine, picks up an entire engine boiler and carries it from point to point. A third holds the boiler suspended, whilst a massive upright steam riveter clunks with one great blow the red hot rivet through the boiler, saving hours of manual labor. The punches, the shears, the planers and the great wheel lathes are all huge, and all apparently perfect for the purpose intended, and yet improvements are being constantly made. The work goes through no less than thirty five different shops before completion, each department of which is presided over by an experienced and competent head. Nearly all the employees are Americans, and the skill displayed by them in the several branches marks Yankee superiority over all other nations.—*Public Ledger.*

Conduct of Railway Employees.

Mr. J. H. Devereux, General Manager of the Atlantic & Great Western Railroad, has given the following instruction to employees of the road: "Treat people as if you appreciated and were willing to acknowledge their custom. Try to accommodate and please. In short, act as any good business man would toward his customers. Don't treat people as if you were conferring a favor on them by letting them ride. Rather seek to make the line popular, because its business is dependent on the good will of the people. You need not be ashamed to let people understand that you acknowledge this. If a passenger refuses to pay, or is rough and abusive, treat him with courtesy but firmness."

Driving Bolt-heads into Wood.

An English journal says:

"If there is a thing which is utterly detestable to look upon by a strict observer and one who has a general knowledge of what is right, it is to see the heads of bolts drawn down below the surface of the wood. The bolt has a certain duty to perform, and where that duty is the securing of a piece of iron to wood, and the nut is firm upon the iron, it is all that is required; but when we commence to draw upon the bolt until the head sets below the surface of the wood, we add the premature rotting at that one point, for, no matter how nicely painted, or how neatly puttied up, there will soon be a cavity for the retention of a few drops of water. This alone would be enough to condemn the practice, to say nothing of the other results it produces."

Operating Railroads by Wind Power.

The St. Paul & Pacific Company owns a line from Glyndon, Minn., on the Northern Pacific, northward to Crookston, which, we believe, is not regularly operated. An exchange says that recently a Crookston party, desiring to attend a land sale at Oak Lake, got hold of a box car, rigged up a sail and ran before the wind to Glyndon, 75 miles, in nine hours.

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CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

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Editorial Announcements.

Removals.—The Chicago office of the RAILROAD GAZETTE *has been removed to No. 77 Jackson street, opposite Third avenue.*

The New York office of the RAILROAD GAZETTE *is removed to Room 131, No. 73 Broadway, opposite the upper elevator landing.*

Correspondence.—We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Inventions.—No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

INVENTORS AND INVENTIONS.

To a young, enterprising and progressive railroad manager, the attitude which he should assume toward new inventions is often one of the most perplexing questions which he must encounter. To test every new or promising thing which is presented would entail endless expense and consume all his time. To condemn all new things lays him open to the imputation—with more or less justice—of being behind the times, and not alive to avail himself of the latest and best improvements in railroad operation. On the one hand, too, he will have conservative officers and stockholders who regard every experiment as visionary and wasteful; while others will be in the confidence of inventors, and, being to a greater or less extent ignorant of the subject presented, give credence to all the plausible representations which are made, and then use their influence to introduce the new thing. In this way a railroad manager or master mechanic often finds himself between two fires, without sufficient freedom to exercise his own judgment, or to dissent from that of others. It often happens, too, that officers who are not responsible for the management of the engineering or machinery departments will use all their influence and authority to introduce a new thing upon insufficient testimony of its merits, knowing that the responsibility will not rest upon their shoulders in case of failure.

If he is entirely free, however, to form his own opinions, there is no duty which a railroad manager has to perform in which he will have occasion to exercise so much intelligence as he will if he attempts to make a just estimate of the value to his employers of new inventions. Each case presented will probably be entirely different from those which have preceded it. He will also learn that the inventor is usually a man destitute of the faculty of reasoning clearly, or of apprehending any truth which is at all adverse to his interests or ideas. In fact, a very singular obliquity prevails generally regarding the nature of the inventive faculty. It is usually confused with a certain aptness for contriving and combining mechanical appliances. Now a person may have this and yet not be a successful inventor. Invention implies an exercise of imagination, it is true, but to be successful it requires that the ideas thus evolved should be guided, controlled and applied by a reasoning process in the highest degree exact and scientific.

That there is a great deal of false sentiment and sympathy wasted upon inventors, any one who has had much intercourse with that class must have learned. We do not, of course, wish to convey the idea that there are not among them clear-headed men who are honest and true, but who, for the want of aid from those who could give it, have been unsuccessful. Such cases have occurred and doubtless will occur; but the reason why it is so difficult for that kind of men to get either aid or sympathy is because there are such immense numbers of crack-brained, loose-headed impracticables, who consume the time, the patience and the attention of those who can and would give assistance and encouragement to those to whom it would be of service. Railroad managers very soon learn to recognize the inventor, with a model under his arm, and only one idea in his head, who edges his way into the presence and acquaintance of those whose position or influence he thinks would be of assistance to him, and does it in a sort of half shy, apologetic sort of way. His invention is always of *immense* value. In explaining its advantages he is sure to warm up as he advances, and soon betrays his inability to see more than one side of the question he is discussing. He is also very apt to reveal his ignorance of the subject to which his invention refers, and it soon appears that he does not comprehend the difficulties he has to encounter nor the conditions under which his contrivance must operate. Now we do not, of course, mean to say that this describes all inventors, but it is true of a large class, who infest nearly every railroad shop in the country. Superintendents, engineers and master mechanics, whose time is usually fully occupied, are wearied and annoyed in listening to their wild statements and loose arguments. It is, therefore, no wonder that railroad officers learn the art of ridding themselves of these intruders, and turn deaf ears to their recitals. Nor is it surprising that they should apply the same rule of conduct to all, and with as much politeness as possible should dismiss all inventors without giving them a full hearing. Now, obviously, there would be great injustice in doing this, and yet it is difficult to discriminate between those who are worthy of attention and those who are not, without listening to what all have to say. When the charge is brought against railroad officials that they are slow to entertain and introduce new inventions and improvements, it should always be made with great allowance for what they are obliged to endure from visionary and half-witted persons, who have only very dim notions of the objects they are trying to accomplish. It should be remembered, too, how exceedingly small a proportion of the inventions which are patented are ever successful. There are now over eight hundred patents for car-couplers, only one of which, to our knowledge, has ever been used to any extent. Now obviously it would not be surprising if a railroad official should take the ground that if, as a rule, he should condemn all new car-couplers he would on an average be right eight hundred times, and wrong only once. This method would also have the advantage, which is exceedingly tempting to an overworked official, that it involves no labor of examination or estimate of the merits of new inventions. The proportion of successful to unsuccessful inventions is perhaps smaller in car-couplers than in most other classes, but the number of patented articles which are put into general and successful operation is always exceedingly small. If, therefore, a system of universal condemnation is adopted for all new things, the person who adopts it is very certain to be right a great many times and wrong very seldom.

The most common fault with inventors is that they do not study nor understand the subjects to which their inventions are intended to apply. Many of them are entirely untrained, either with the discipline that the transaction of business and the management of affairs gives, or that which comes from hard study and mental education, and, therefore, all their ideas have a very loose, parasitic kind of hold of the subjects to which they refer. Instead of testing in every possible way the efficiency of their inventions, and of proving by clear and logical reasoning and experiment, so that all sources of error are eliminated and the truth presented in a certain and unassailable form, they are apt to present only crude and immature ideas, the futility of which the practical instinct of any experienced railroad manager is very sure to see at once. It is for this reason chiefly that inventors as a class have fallen into disrepute among railroad managers—because so many importunate and impecunious people, who should be studying the elements of mechanics or learning a trade, are continually presenting their crude ideas.

To refuse to try any new thing or to use any invention which is patented, as some railroad companies have done, is a policy which, if generally adopted, would make all future improvement impossible. That experiments, if intelligently made, would be very profitable to railroad companies, there can be no doubt; but it is also true that a great deal of money can be wasted by going over old ground, or by making experiments carelessly or ignorantly. When, however, a new invention is presented, it must have some ground of merit which is capable of being clearly stated, and should be as unassailable as a judge's charge to a jury, and be based on equally sound reasons and evidence. Usually, however, the merits of inventions are presented only by very glittering generalities, loose assertions and extravagant claims. It happens very often, too, that inventors have an incapacity for seeing the truth concerning their own pet projects. There is another class who have no faith in the ultimate triumph of truth, who believe that humbug is a power in the world, and that it works successfully instead of inevitably ending in failure and disaster, as it always does Now if an exact and accurate statement of the merits of an invention is made in writing, a little clear analysis of the arguments and facts to support them will nearly always reveal the strength or the weakness of the claims made. Usually, however, it will be found that the humbug class of inventors are very much averse to making any such statements. Believing as they do that the success of an invention depends upon the skill with which it is "introduced," they regard all refutation of their fallacious assumptions as only skillful trickery to defeat their projects. In examining the merits of any new thing, therefore, it is well to demand of the inventor a clear statement of the advantages claimed. Such a statement should, if the invention have any actual merit, set forth clearly its advantages; and if it have none, the document will be very apt to reveal a tendency to vagueness of statement, or else, if more specific, show the weakness of the case presented. It will at any rate be capable of being submitted to experts, and will furnish a distinct and tangible presentation of what is claimed, which is sometimes very difficult to obtain from the oral statements of inventors.

THE COST OF ACCIDENTS.

In our "Chicago Railroad News" we note the conduct of sundry lawyers who seek the public good and much-needed employment for themselves by writing letters to those who suffered from the Lemont collision and advising them to decline a settlement, but to insist on prosecuting the company, "which ought to be made to sweat," these disinterested persons say.

We do not purpose to consider this proposition, but rather to see how far railroad companies do suffer from the consequences of accidents caused by their negligence or otherwise.

The law makes common carriers responsible for the lives and limbs and property of those whom they carry, except when the injury is caused wholly or in part by the negligence of the sufferer. The carrier cannot claim exemption because the fault is in its servants, not even when these servants have deliberately disobeyed its orders, and when the coporation has exercised all care in selecting and superintending them. This sometimes seems hard; but the law evidently has been made for the purpose of enforcing special care and vigilance in the carrier, who, being to a certain extent the insurer of its passengers, naturally takes an insurer's pecuniary interest in their safety.

So almost every man injured by a train accident costs a railroad company something. There are laws limiting the compensation for death in some of the States, at least, but for disabling persons the damages are frequently assessed at very large sums, proportionate somewhat to the earning ability of the person disabled, and the length of the disability. In Illinois the limit for a death is $5,000, we believe.

The most costly accident of which we have an exact statement was that at Revere, Mass., on the Eastern Railroad. At the closing of the last fiscal year, September 30, 1872, the company had expended $134,784.88 on account of this accident, and the claims were reported to be substantially settled. This was done, we believe, with but one or two cases of litigation. This sum, lost we may say in one day, is considerably more than the road ever earned for its shareholders in a whole year, and was equivalent to an assessment of 10½ per cent. on the stock. This certainly was a very heavy fine and the company "sweat" pretty freely.

The Chicago & Alton Company will have to pay, probably, for nearly twenty persons killed and a greater number injured, besides the large expenses attending the accident, many of which it was not legally bound to make, but made willingly for the same reason that a man might spend money freely in relieving the distressed, and besides the value of the rolling stock destroyed, which may by itself reach $20,000. It is not impossible, we suppose, for the whole cost of the accident to reach

$150,000 to $200,000, which is equivalent to an addition of 5 or 6 per cent. to the year's working expenses, and cannot be paid without making an impression even on so wealthy a company as the Chicago & Alton.

From the numerous propositions to fine railroad companies enormous amounts for accidents, and from the charges of recklessness against directors, it would seem that the public is not generally aware how much railroad companies actually suffer from their accidents. These exceptionally costly ones may make a great impression both on the companies and the public; but it is the slighter accidents which in the aggregate form the heaviest burden, and one which every company has to bear. Aside from damages to persons, a very large amount is absorbed annually in the rolling stock and freight destroyed, and sometimes a much greater damage is caused by the blocking of the road by wrecks on lines worked up to their capacity. It would probably be impossible to estimate the aggregate cost of accidents in any section, or even on any line; but it would seem well worth their while for railroad companies to keep an account as exact as possible of such expenses. When a great accident comes, it is pretty sure to set men to thinking on the subject; but even railroad men are apt not to feel sufficiently the lesson taught by numerous slight accidents, unattended by loss of life, which should all be incentives to care and vigilance. No one, it should be needless to say, suffers so much, pecuniarily, from accidents as railroad companies. We see that the entire annual profits of the owners of one railroad were absorbed by a single accident. This is as if a great merchant should be deprived of the entire income from his business for a year by the disobedience or negligence of a clerk (or a mistake of his own). In such a case the public would feel that he was at least sufficiently punished; but in the case of the impersonal railroad corporation, where the losses are divided among all the shareholders, the amount is not so readily felt, though it may result in the deprivation of several persons of their sole income. The companies, of course, cannot fail to feel it, and it doubtless has the influence it was intended to have—that of increasing care in the working of a road and the disposition to look out for and adopt whatever improvements tend to decrease the possibility of accidents or the destructive effects of such as do occur. That false economy which results in a destruction of ten times the amount saved will not last long, except with stupid as well as inhuman managers; but it is not always that sufficient attention is paid to either the causes or the cost of accidents to enable men to know what, or the lack of what, is eating up their profits.

The Lemont Collision.

The terrible accident between Willow Springs and Lemont, Ill., on the Chicago & Alton Railroad, which occurred on the night of the 16th instant, is probably the most serious railroad casualty that has occurred in America since the accident on the Grand Trunk Railway, near Shannon, in June of last year—which, by the way, was very similar in its effects, though a derailment and not a collision, nearly all the casualties in both cases being caused by the escape of scalding steam from a punctured boiler into a car full of people which had been thrown upon the engine by the shock.

The Chicago & Alton accident, which has resulted in the death of 19 and the injury of 32 persons, has of course called out a great deal of discussion and innumerable suggestions, such as every serious accident occasions. In this case we have not to go far to find the cause of the collision, nor to fix the responsibility for it. It was perhaps the clearest case of disobedience of orders that we have ever had to report. Trainmen who were familiar with their duties, familiar with the rules, and familiar, too, with the special circumstances existing at the time, ran their train directly upon another train's time and into the train, of course to their own imminent peril, and, alas! to the killing by torture and the maiming of a large number of other people.

But it is not enough to show that there was criminal disobedience of orders. No one believes that such disobedience was malicious—it must have been either through recklessness or an astonishing forgetfulness, and that, too, on the part of two men at once. If such recklessness and forgetfulness are possible, especially among carefully selected and well-paid men, such as the Chicago & Alton has in its service, we should at least try to contrive additional checks on these vices or weaknesses, and it is on this account chiefly that the accident is worth studying.

The Chicago & Alton probably ranks with the very first in the country in the condition of its permanent way and rolling stock. It ranks with the first Western roads in its traffic, which has for some years usually produced about $10,000 per mile. It is the heaviest coal-carrier in the West, and this business is mostly on the 53 miles of the road between Chicago and Wilmington. The general traffic of the road is also the largest at that end. The coal traffic has grown rapidly of late, and has made the necessity of a second track felt. About 25 miles of such track has been laid, and work has been in progress this season on an extension of it to Chicago. The need of it was somewhat less on the extreme northern section by reason of its turning a large amount of eastern business done in through cars to the Joliet cut-off of the Michigan Central at Joliet, 38 miles from Chicago. This end of the road is, however, pretty well crowded, perhaps more so than any other single-track road entering Chicago, though not nearly so much so as was the part of the Chicago, Burlington & Quincy between Chicago and Aurora before it completed a second track between those places, which was but recently. As to the quality of its management, it is best to judge it by its fruits, which are the conduct of an exceptionally heavy traffic for a long series of years without the death or serious injury of any passenger in a car.

Briefly, the circumstances of the collision were these: A south-bound express train (No. 4) was running from Chicago to St. Louis with the right of way against all trains except the opposing express (No. 3). This train left Willow Springs, 18 miles from Chicago, at 10:06—about fifteen minutes late. A north-bound coal train (No. 23) ranked as fourth class, which had to keep out of the way of all trains, was running into Chicago. It reached Lemont, 25 miles from Chicago, about 10 o'clock, and remained a few minutes. It was about an hour and a half behind time, and the express train was due at Lemont almost at the very instant at which the coal train left, which was 10:05—one minute before No. 4 left Willow Springs. The coal-train conductor asked for no orders and got no orders, but ordered his engineman to pull out and go ahead, and the engineman obeyed him. The natural consequences followed. The coal train, with a ten-wheeled engine and 35 loaded cars, on a down grade, and the express train, with express car, baggage car, smoking car, two day coaches and two Pullman sleeping coaches, going at the rate of about 30 miles an hour, met about two miles north of Lemont, where a curve and a dense fog combined to hide the trains from each other until they were close together, and only gave time for quick calls for brakes, which were almost coincident with the crash of the collision.

Being on a curve, the heavy coal-train engine (weighing 45 tons) pushed the express engine over to the inside of the curve, ran under the express car and doubled it over the baggage car, shoved the latter also to the inside of the curve, breaking it loose from the smoking car behind; then, still keeping the track apparently, it struck the smoking car full in front, lifted it up on its pilot and went under the front and through the door timbers, tumbling the passengers (the car was crowded) into the rear end. This square stroke on the end of the car punctured the boiler and let the scalding steam and water into the smoking car, so that every person in it, except one or two who fell through the breaks, was more or less scalded, most of them severely and a great many fatally. Nearly all those injured were scalded by the steam except the men on the passenger engine. An engineman on this locomotive who was learning the road had his head cut off; its fireman was buried in coal and bruised to death (though scalded also), and its own proper engineman was so hurt in jumping as to endanger his life and make him delirious down to our last information, while the engineman of the coal train was also slightly injured in jumping. Still, notwithstanding the terrific shock between a train so heavy and one running at such speed, whose momentum could have been very little modified by brakes or reversing, probably no injury, or very little, would have been suffered by passengers had not the steam escaped from the engine into a car, producing effects such as commonly follow explosions of river steamboats—that is, the killing of passengers by inhaling scalding steam. The two coaches and the two heavy sleeping cars behind the smoking car, struck with such terrible force as to bring them to a stand immediately, were scarcely injured at all, and did not leave the rails, and the passengers in them were hurt only by being thrown from their seats or berths by the shock. This was owing, doubtless, to the construction of the cars with Blackstone's platform, which, so far as the shocks of collisions are concerned, has an effect very similar to that of Miller's better known apparatus.

As to the effects of the accident, however, we are less concerned than as to its cause. American railroads have probably by far the most effective arrangements for mitigating the effects of accidents known in the world. In this case, too, all the trainmen seem to have had their wits about them after the accident had happened, and taken all possible precautions against further disaster and for the relief of the victims. Indeed, relief was being prepared before the accident occurred, for the station agent at Lemont, astonished at the coal train's pulling out on the opposing train's time, had telegraphed to Willow Springs, learned that the express train had left, notified a freight train then at the station that a collision was inevitable, sent for physicians and listened for the approaching shock, which was soon heard.

Now there can be no doubt as to the proper place of the coal train No. 23. It did not have even a chance of reaching the next station without meeting No. 4, unless the latter should be long behind time, and No. 23 nor any one below No. 4 itself had any reason to suppose it to be behind time at all. Had it been just on time the collision would have occurred half a minute above Lemont. The conductor of No. 23, who had served the company faithfully and accurately for two years or more, and had run this same train, which, being fourth-class, has always to be looking out for trains and passing them at various stations, for about a year. He was seen by several men immediately after the collision, and offered as his only explanation that he "forgot all about No. 4 until two minutes before they struck." As it is hardly supposable that he intended to cause a collision, we suppose that he probably told the truth; and it then becomes important to know what check, if any, there was on his forgetfulness, and why it failed in this case. The check was the usual one—the responsibility of the engineman, who is bound equally with the conductor to know and run by the time-table which he carries in his pocket, and to disobey any instructions from the conductor contravening these rules. He, as well as the conductor, knew that No. 4 must be met and that it was due at 10:05, the moment when he started. He asserts, however, that his watch was 50 minutes behind time, and that by it he had plenty of time to meet and pass No. 4 at Willow Springs, and some one to whom he showed his watch shortly after the collision confirmed his statement as to the time of the watch then. But on the other hand the station agent at Lockport saw him consult the clock there at such a time that he ought to have known his watch was wrong had it shown 9:15 when he left Lemont. It was running after the accident, and there is a disposition to believe that he did not consult his watch, but took orders from the conductor on trust, taking it for granted that he was right and without considering his own responsibility. This supposition is held to be more probable because the engineman had been but a short time on the road, and might think himself hardly qualified to question the orders of a conductor so much more familiar with the train, the road and the rules.

Now of the neglect of the conductor there can be no question. The engineman is made equally responsible in order to have a check upon the conductor, however, it being supposed that there can hardly be a coincidence in their neglecting or forgetting anything. If the engineman's watch suddenly stopped for 50 minutes and then started again, as he said it did, then there would be a coincidence in the failure of the conductor to remember and the failure of the watch, which was the engineman's guide, to keep correct time, and the remedy (with this system) is a better surveillance of time-pieces; if, however, the engineman neglected to consult his watch or to consider the time-table, taking it for granted that the conductor would not err, then the fault was in the lack of strict obedience in the engineman, and the remedy is a more effective discipline.

"A more effective discipline," doubtless, is needed on almost every American railroad, and the need of it, we believe, is quite generally recognized, though the means of attaining it are not. There is probably scarcely a company which has not felt the inadequacy of the punishments which it is able to impose for the most flagrant and dangerous neglects and disobediences. Had the train-men in this case discovered each other's trains in time to stop before meeting, the Chicago & Alton Company could hardly have done more than discharge the guilty parties and inform other companies of their conduct; and the probability is that in a few years at most they would be running trains again somewhere between Maine and California. In this case even, when two men are directly responsible for the death of about twenty persons, it is doubtful whether the law will afford any other punishment than the confinement preceding an examination. An adequate punishment would doubtless have a great effect and enable railroad officers to maintain strict discipline much better than heretofore. "Obey orders or be discharged" has not a strong deterring effect on train-men who are pretty sure of getting employment again, of some kind, very soon; but "obey orders or serve a term in the penitentiary" is quite another thing, and will be so felt.

The forgetfulness of the conductor of No. 23 (Edward Beane) is certainly remarkable, considering the circumstances and his familiarity with them. Still it must be remembered that men will forget sometimes, and that it is necessary to put a check on forgetfulness. The failure of this check seems to us more alarming and more significant than the original forgetfulness. If it is true that the engineman of No. 23 took the conductor's orders on trust (and we fear that it is very often true of enginemen), then his guilt seems to us the most flagrant: the conductor "forgot" his duty; the engineman did not attempt to do his. Very generally, we fear, when two or more men are held equally responsible for the same act, the effect is in reality to lessen the sense of responsibility in all, or in all except the one upon whom it naturally falls first. The cases are very few in which their check is needed, and when a man has seen a thousand successive instances in which his care was not needed to assure safety, he is inclined to act as if there was no need of his caring—and then of course there is no check. Anything which can be done to insure the watchfulness of those who serve as checks on the neglect or dissobedience of others will do very much towards greater safety.

The conduct of the corporation in this case was as eminent as the direfulness of the accident. No pains or expense have been spared to care for the dead and wounded, open to investigation the circumstances of the accident, and bring to justice the men responsible for it. On complaint of the company, the engineman of the coal train was arrested and confined. For the conductor, who disappeared the morning after the collision, it offered a reward of a thousand dollars; and it advertised to pay a liberal reward for information of the friends of two of the killed—the sole instance on record, we imagine, in which a railroad has offered to pay for finding men to whom it would probably have to pay large damages. No one who knows how greatly (and justly) the officers of this company valued its reputation and theirs for carrying passengers a long series of years without any casualties, can doubt the bitterness of their sorrow or the heartiness of their exertions to do what was possible to alleviate the consequences of this calamity; and no one who knows how much a railroad officer prizes a reputation for uninterrupted safe conduct of passenger traffic will doubt that the Chicago & Alton officers regret this calamity more bitterly than any one else can, and will use their utmost exertions to prevent any repetition of it.

The Nashville, Chattanooga & St. Louis Railway.

This company's line extends from Chattanooga, Tenn., north by west to Nashville, and nearly west to the Mississippi River at Hickman, Tenn., a distance of 321 miles, with a branch 7 miles long from War Trace (53 miles southeast of Nashville) to Shelbyville, and one 13 miles long from Bridgeport, Ala., (18 miles west of Chattanooga,) to Jasper, Tenn., making a total of 341 miles of road owned and worked by the company. It succeeded, during the past year, to the Nashville & Chattanooga

and the Nashville & Northwestern companies, the first of which owned the 151 miles between Nashville and Chattanooga and the 20 miles of branches, and the latter the 170 miles between Nashville and Hickman. The Nashville & Chattanooga bought all the stock and bonds of the Nashville & Northwestern, and then had its name changed to cover the whole line.

The report of the President, Mr. E. W. Cole, of Nashville, for the fiscal year ending with June, 1873, shows that at that time the company owned, besides 311 miles of railroad (with 30 miles of sidings), 83 locomotives and 1,164 cars of all classes, and some timbered lands held for fuel supplies. The report estimates the value of the permanent way at $40,000 per mile, and that of the other property at a total of $2,000,000, making the whole property worth $15,640,000. This is represented by the following capital account:

Capital stock ($9,632 per mile)	$6,456,043 44
6 per cent. bonds indorsed by State Treasurer	1,425,000 00
6 per cent bonds unindorsed	20,000 00
4 per cent. bonds to United States	1,300,000 00

It agreed to pay the State of Tennessee $2,400,000 in the State's bonds for its interest (the first mortgage) in the Nashville & Northwestern, one-half of which it has already paid. It also owes the State $361,165 of the State bonds which were loaned to it, and also $148,220 in money to the State for payments of guaranteed interest during the war. There is a floating debt of about $250,000 for improvements of road and additions to equipment of the Chattanooga Division, and $480,520 for similar expenditures on the St. Louis Division. The Tennessee bonds owed can be bought at a discount of about one-sixth, so that the debt to be paid in that paper is equivalent to $1,303,475, which, added to the other floating debt ($878,740 in all), makes a total of $2,182,211 to be added to the mortgage debts in the table above. This gives a total funded and floating debt of $4,627,211, or $13,570 per mile of road.

The report announces that the company is now having prepared a first mortgage on the whole property, at the rate of $20,000, which will make a total of $6,820,000. This is to be applied to the payment of the present debts, funded as well as floating, the largest part of the former of which falls due within a few years. "The surplus proceeds of these new bonds will be held to be used for the best interest of the company, as may be seen by the directors, or instructed by the stockholders." The new issue is to bear 6 per cent. gold interest and run for 40 years, and it is intended to sell $4,375,000 of them now, to retire the present debt.

The report of earnings and expenses for the year will serve to indicate the security of the bonds to be issued. These were for the 171 miles of the Chattanooga Division:

Passengers	$382,476 77
Freight	1,252,841 10
Mails	25,680 04
Rents and privileges	18,651 00
Total ($9,632 per mile)	$1,653,549 31
Working and other expenses (71½ per cent.)	1,183,787 66
Net earnings ($2,727 per mile)	$467,761 65

For the 170 miles of the St. Louis Division they were:

Passengers	$330,305 19
Freight	331,456 85
Mail	15,002 35
Rents and privileges	12,280 97
Total ($3,789 per mile)	$642,681 36
Working expenses (87 per cent.)	559,150 33
Net earnings ($491 per mile)	$83,531 03
Net earnings of both divisions ($1,623 per mile)	$555,292 68

These net earnings were sufficient to pay the interest on the proposed issue of $20,000 gold bonds per mile, counting the premium at one-sixth, and leave a margin of $228 per mile.

The report says that an addition of $100,000 might have been made to the net income but for blockades in the connections of the road, and the late epidemic of cholera in Nashville.

The receipts of the 151 miles of main line between Nashville & Chattanooga were at the rate of $10 878 per mile, which is greater than on any other Southern road, just two and a half times the average of Southern roads, and a little more than the average earnings of New England railroads. Much is expected from various new railroads in construction or projected, especially for the Chattanooga Division, which commands the most direct approach over the mountains from the North to Georgia and the States east of it, and has but one competitor (the Louisville & Nashville's line from Nashville to Montgomery, Ala.) for traffic crossing the Southern mountains. The local traffic of this division increased by about $63,000 during the year. The total earnings of the St. Louis Division increased $21,130 in the same time, or about 3½ per cent., the through freight traffic yielding $81,000 less (largely on account of the closing of the Mississippi above Hickman, which prevented receipts from boats and car transfers for weeks in the busiest season), the through passenger traffic $36,474 more, and the local traffic $65,680 more.

The President estimates for the next year an increase of 10 per cent. in receipts and a decrease in the percentage of working expenses to 70 for the whole line, against 75¾ per cent. for the last year. With such an improvement the interest on the current debt and a 6 per cent. dividend on the stock will be carried.

Certainly this is not an extravagant increase in receipts to expect, with a good cotton crop in the South, an increase in the coal traffic (already averaging 45 cars per day), and no new competitors existing or probable. And the reduction in working expenses ought certainly to be possible unless the line is in much worse order than it is reported.

Developments of the Illinois Railroad Law.

The Illinois Railroad Commissioners, it is reported, have agreed to report three cents as the maximum permissible rate per mile for passengers on railroads of the first class in the State, including most of the Chicago roads. The tariffs which the Railroad Commissioners are instructed to prepare are not to take effect until early in January next, just after the assembling of the Legislature, and then are not made absolute, but only *prima facie* evidence that higher rates are extortionate. That is, the charging of higher rates will make the offender liable to prosecution by the State, and, should the constitutionality of the law be affirmed by the courts, to fines of various amounts, according to the number of the offense, but none, we believe, less than $5,000.

The recent break in rates from New York westward, owing to which freight is carried in that direction for much less than cost, is reported to be likely to cause the Commissioners to prosecute complaints. The Toledo, Wabash & Western is reported to be charging little or no more on some classes of freight carried from New York to Springfield than it does from Springfield to the Illinois line—about a hundred miles. The railroad companies, and nearly all good lawyers, insist that the State cannot regulate charges on any traffic which is carried to or from points outside of the State without infringing on the powers of the General Government; but the Railroad Commissioners have given an opinion that the law does apply to such traffic, so far as to make it unlawful to charge as much for carrying a given distance within the State as for carrying the same distance within the State and some distance besides outside of the State. If the Commissioners insist on making a test of this point, it is probable that they will have abundant opportunities, as it is simply impossible to do a through business on many lines under this rule. The roads whose lines cross Iowa as well as Illinois have much of the time made grain rates nearly or quite the same to Chicago from all Iowa stations, some of which are 300 miles nearer Chicago than others. Indeed there has not been much left for the producer of corn at the eastern stations, and with the more western stations it lay between carrying for a trifle a large part of the way or abandoning the traffic and leaving the farmers absolutely without a market.

The inapplicability of the law is shown very clearly by an attempt to fix Toledo, Wabash & Western rates on the basis of the current freight rates westward. This traffic is one which is hardly increased at all by a reduction of rates, so the reduction, amounting on the average probably to 66⅔ per cent., is just to that extent a reduction of the income of the railroads. It is doubtless better for the companies to take freight at these absurdly low rates than to refuse it; for their expenses would hardly be reduced at all did they carry nothing westward; the chief loads are eastward, and the cars must go back, full or empty. Fifty dollars a car-load to Chicago is much better than nothing, since the car must go, though it is not nearly so good as $200. But it ought to need no explanation that a similar decrease on *all* the traffic of a company, through and local, east-bound and west-bound, would deprive it of nearly or quite two-thirds of its income, leave it but half enough to pay its working expenses, and leave the richest company in America bankrupt in less than a year.

Record of New Railroad Construction.

This number of the RAILROAD GAZETTE has information of the laying of track on new railroads as follows:

Geneva & Ithaca.—Track laid from Geneva, N. Y., southeastward and from Ithaca northwestward in all 25 miles. *Montpelier & Wells River.*—Extended from Marshfield, Vt., eastward 3 miles, and on the eastern section from South Bregate westward 6 miles to Groton, Vt., in all 9 miles. *Western Maryland.*—The independent entrance into Baltimore has been completed from Owing's Mills southeast 12 miles to a junction with the Baltimore & Potomac in the western part of Baltimore. *Buffalo & Jamestown.*—Extended from Eden Center southwest 10 miles to Taylor's Hollow, N. Y. *Peoria, Atlanta & Decatur.*—Track laid from its junction with the Toledo, Peoria & Warsaw, near Peoria, southward 2½ miles. *Green Bay & Lake Pepin.*—Extended from Merrillan, Wis., southwestward 15 miles. *Winona & St. Peter.*—Extended westward 10 miles to the western terminus at Lake Campeska, Dakota. *Texas & Pacific.*—The *Jefferson Division* has been extended from Monterey, Tex., north by east 7 miles to a point sixteen miles north of Jefferson; and track has been laid on the *Transcontinental Division* from Sherman, Tex., eastward 10 miles.

This is a total of 100½ miles of new railroad, making the total completed in the United States in 1873, 2,125½ miles.

FREIGHTS RATES WESTWARD are in a terribly demoralized state, owing to a reckless competition. There is a constant inclination to this, from the fact that most cars go back empty, and the addition of a car-load in that direction is almost clear gain, however little may be received for it. So a company which gets any freight from a competitor is apt to count it so much profit: and so it would be if two could not play at that game; but they can, and more too. And as no reduction of rates even to the lowest figures ever reached, has any considerable influence in increasing eastward shipments for the year, the companies actually steal business from each other, and lose almost exactly in proportion to the amount carried. The reduction does have a temporary effect, to the companies very injurious, in hastening shipments which would otherwise be delayed, and thus creating the appearance of an increase of business by reason of a reduction of rates. But this is only because it is known that rates may be raised any day, and that they almost inevitably will be within a few weeks. But afterward it is found that shipments fall off just about to the extent to which they increased when the rates were lowest.

All this month rates have been broken, and this week the following further reductions were made in rates from New York:

To Buffalo	from $ 50 to 22	To Memphis	from $1 35 to 98
To Erie	from 49 to 26	To St. Louis	from 97 to 55
To Toledo	from 78 to 31	To Fort Wayne	from 65 to 35
To Detroit	from 73 to 28	To Chicago	from 63 to 24
To Cleveland	from 49 to 26	To Milwaukee	from 73 to 28
To Columbus	from 60 to 32	To Atchison	from 1 39 to 97
To Cincinnati	from 70 to 37	To Leavenworth	from 1 39 to 97
To Indianapolis	from 71 to 38	To Kansas City	from 1 39 to 97
To Louisville	from 86 to 49	To St. Joseph	from 1 39 to 97
To Nashville	from 1 10 to 73		

These ought to be low enough to satisfy the most exacting; but of course there are many shippers—as those who laid in their stocks just before the break—who will suffer greatly by it.

NEW PUBLICATIONS.

A Practical Treatise on the Movement of Slide Valves by Eccentrics. By C. W. MacCord, A. M. (D. Van Nostrand, New York.)

This book might, if the expression be admissable, be termed a graphical analysis of the motion of slide valves. Each function and member of the valve is exhaustively analyzed separately, and rules are then given for proportioning the different parts to the work to be done, or to the special circumstances under which the valve must be used. The fault of the book seems to be over-elaboration. In attempting to simplify the subject, so many new methods of explanation and illustration are introduced that the latter become more difficult to comprehend than the subject itself.

It discusses the common three-ported slide valve and independent cut-off valves, and the influence of the angular vibrations of the main connecting-rod and the eccentric rod. There is no discussion of the link motion, which of course lessens its value to railroad engineers; but all students of valve motion will find much instruction and information in its pages.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

—Mr. Joseph Angell, late chief operator in the Erie Railway office in New York, has been appointed Superintendent of Telegraph on the New York & Oswego Midland Railroad.

—At the annual meeting of the Belfast & Moosehead Lake Railroad Company in Skowhegan, Me., recently, Hastings Strickland, Aaron Babb, W. G. Shaw and S. P. Strickland were chosen directors. Samuel P. Strickland was elected President and J. F. Rawson Clerk and Treasurer. The road is leased to the Maine Central Company.

—Mr. Henry G. Stebbins, of New York, has been chosen a director of the Pacific Mail Steamship Company and has accepted the position.

—The directors of the Maysville & Lexington Railroad Company have reappointed T. J. Glenn to be General Superintendent and General Ticket Agent, and W. G. Sanborn to be Assistant Superintendent and General Freight Agent, for the ensuing year.

—At the annual meeting of the Lamoille Valley Railroad Company (which is building a part of the Portland & Ogdensburg line through Vermont) at St. Johnsbury, Vt., August 12, the following board of directors was elected: Franklin Fairbanks, J. D. Bell, D. W. Aiken, O. Abell, G. W. Hendee, Waldo Brigham, Orange Buck, R. S. Read, O. S. Rixford, D. D. Wead, A. B. Jewett.

—Mr. O. D. Brown has been appointed Chief Engineer of the Southern Minnesota Railroad, in place of A. P. Maun, who has been appointed Chief Engineer of the La Crosse Bridge Company.

—At the annual meeting of the Clayton & Theresa Railroad Company at Lafargeville, N. Y., August 12, A. F. Barker, R. B. Biddlecom, John Dorr, N. Halloway, John Johnston, S. D. Johnston, Thomas Reese, Wm. Rogers, S. W. Strough, John A. Snell, Wm. Whaley and James Johnston were unanimously re-elected directors. At a meeting of the directors on the same day, A. F. Barker was re-elected President; John Johnston, Vice-President; R. B Biddlecom, Superintendent, Secretary and Treasurer, and Nathan Halloway, Wm. Rogers, Thomas Rees, R. M. Esselstyn, Finance Committee.

—The Beaumont, Corsicana & Fort Worth Railroad Company was organized at Corsicana, Texas, August 13, by the election of the following officers: President, Colonel Wm. Croft, Corsicana, Texas; Vice-President, Major Farris, Waxahachie, Texas; Treasurer, Captain Garrity, Corsicana, Texas; Secretary, Major Alexander Beaton.

—Mr. W. L. Peck, formerly in the Auditor's office of the Atlantic & Great Western at Meadville, Pa., has been appointed Traveling Auditor of the New Jersey Southern Railroad.

—Mr. Henry M. Flint has been appointed Superintendent of the Middle Division of the New York & Oswego Midland Railroad, which includes the main line from Middletown, N. Y., to Norwich, 145 miles, and the Crawford, Ellenville, Delhi and New Berlin branches. Mr. Flint was formerly telegraph operator and conductor on the Erie, and lately has been Superintendent of the Montclair Division of the Midland.

—The first board of directors of the Olympia Railroad & Mining Company is as follows: George S. Dodge, Charles N. Felton, Gardner S. Lawton, John N. Goodwin, Edward S. Salomon. The address of the company is San Francisco, Cal.

—At the annual meeting of the Peoria & Springfield Railroad Company in Springfield, Ill., August 20, the old board of directors was re-elected as follows: John T. Stuart, James C. Conkling, John Williams, George N. Black, Springfield, Ill.; Sidney Pulsifer, A. J. Hodges, Peoria, Ill.; James Haines, D. T. Thompson, Pekin, Ill.; M. Allaire, Menard County, Ill.; The board elected James Haines, President; James C. Conkling, Vice-President; Sidney Pulsifer, Treasurer; A. J. Ware, Pekin, Ill., Attorney. An Executive Committee was chosen, consisting of John T. Stuart, J. C. Conkling, George N. Black and A. J. Hodges. Also a Committee on Accounts and Claims, consisting of John Williams, Sidney Pulsifer and George N. Black.

—At the annual meeting of the Nashville, Chattanooga & St. Louis Railroad Company recently, the following directors were elected: E. W. Cole, John M. Bass, G. M. Fogg, John Frizell, G. M. Fogg, Jr., Nashville, Tenn.; E. L. Jordan, John W. Childress, Murfreesboro, Tenn.; Thomas C. Whiteside, Thomas Lipscomb, Shelbyville, Tenn.; W. S. Huggins, Coffee County, Tenn.; J. F. Anderson, J. B. Hawkins, Franklin County, Tenn.; Jackson Pryor, Marion County, Tenn.; Vernon K. Stevenson, New York; John Porterfield, B. F. Wilson. Messrs. Porterfield, Wilson and G. M. Fogg, Jr., are new directors, replacing A. E. Patton, Benjamin May and J. P. King. The board re-elected the old officers, as follows: President, E. W. Cole; Secretary and Treasurer, W. A. Gleaves; General Bookkeeper, R. C. Bransford; General Superintendent, J. W. Thomas; Resident Engineer, R. C. Morris.

—At a meeting of the directors of the Boston, Hoosac Tunnel & Albany Railroad Company, in Albany, N. Y., August 16, the following officers were elected for the ensuing year: President, John Swinburn; Vice-President, C. A. Stevens; Secretary, J.

BIDS FOR ERIE RAILWAY BRIDGES.

We give below a tabular statement of the bids made for the construction of 25 iron bridges on the Erie Railway, in accordance with the specifications which we published last week. The descriptions are from the descriptive table supplied by the company's Chief Engineer to the bridge manufacturers who were invited to compete. The number of competitors, it will be seen, was eleven, including most of the well-established Eastern firms. The Watson Manufacturing Company is the only establishment which bid for all the bridges, though the Baltimore Bridge Company and the Phillipsburg Manufacturing Company bid for all except the one for which a Post truss was specified.

No. of Bridge.	Division of Road.	Nearest Station.	No. of Spans.	Clear Span.	Total Length of Truss.	No. of Tracks.	Kind of Bridge.	No. of Trusses.	Angle of Bridge with Pier.	Height from Masonry to Base of Rail.	Distance between Trusses, Center to Center.	Remarks.	Clarke, Reeves & Co., Phœnixville.	Chas. Macdonald, 80 Broadway, N. Y.	Baltimore Bridge Co., Baltimore, Md.	Phillipsburg Manufacturing Co., Phillipsburg, N. J.	Watson Manufacturing Co., Paterson, N. J.	Detroit Bridge & Iron Co., Detroit, Mich.	Keystone Bridge Co., Pittsburgh, Pa.	Kellogg Bridge Co., Buffalo, N. Y.	Kellogg & Maurice, New York	Patapsco Bridge & Iron Works (Baltimore's bid not included)	T. Leighton.
*20	Eastern	Turner's	1	70	76	2	Through.	2	90°					$120 00	$124 00	$100 00	$100 00	$117 00	$127 00	$101 20			
†32	"	Hampton	2	60 / 60	65 / 65	2	Deck.	2	90°	12 ft.		Truss			75 00	80 00	81 25		91 72	99 17		103 30	
*35	"		1	30	33	2	Through.	3				Plate girder			60 00	42 00	51 30		72 00			97 70	
*5	Delaware	Lackawaxen	1	40	44	2	Deck.	3	90°	5 ft.		" "			96 40	60 00	65 00		90 00			118 10	
†6	"	"	2	129	135	2	Through.	2	33°					g144 00	a174 50	150 00	146 66	170 00	180 00	162 07			
†7	"	Pine Grove	2	127 / 127	133 / 133	2	Deck.	2	84°	18 ft.	18 ft.			119 90	140 00	150 00	b113 00	160 00	136 00	122 71		209 20	
†8	"	"	1	60	66	2	Deck.	2	90°	12 ft	16 ft				76 00	80 00	78 00	88 00	90 00	118 18		98 00	
†12	"	Calleson	1	80	88	2	Through.	2	45°					120 00	137 00	115 00	107 50		160 00	155 11	110 00		
†15	"	Hankins	1	151	160	2	Deck.	2	60°			Truss[1]					97 00			77 62			
†16	"	Basket	1	50	54	2	Deck.	2	90°	6 ft.	16 ft.	Plate girder			120 00	68 00	71 30		102 00			116 10	
†17	"	Stockport	1	50	54	2	Deck.	2	90°	6 ft.	16 ft.	" "			120 00	68 00	71 50		102 00			116 10	
*25	"	Susquehanna	4	49 / 110 / 110 / 110	44 / 116 / 116 / 116	2	Deck.	2	90°	5 ft.	16 ft.	" "			96 00	60 00	60 00		90 00			98 00	
†5	Susquehanna	"	1	34	40	2	Deck.	2	90°	18 ft.	18 ft.			g124 69	99 60	118 50	154 00	c37 25	141 00	118 00	117 24	120 00	168 35
†10	"	Great Bend	1	40	44	2	Deck.	3	90°	4½ ft.		Plate girder			95 00	52 00	64 00		87 00			118 10	
†11	"	"	1	40	44	2	Deck.	3	90°	5 ft.		" "			95 00	61 00	65 00		90 00			118 10	
†16	"	Kirkwood	1	60	67	2	Through.	3	90°	5 ft.		" "			95 00	61 00	65 00		90 00			118 10	
§73	"	Corning	4	173 / 137 / 137 / 137	180 / 144 / 144 / 144	2	Through.	2	42°					171 00 / d147 00	187 50 / e167 50	168 00	174 00	215 00	210 00	190 18	200 00		185 00 / 166 00
†27	"	"	1	29	33	2	Deck.	2	90°	5 ft.	16 ft	Plate girder			63 00	40 00	46 00		73 00			61 00	
†87	"	Somebody's	1	40	43	2	Through.	2	90°			" "			98 00	64 00	66 75		90 00			68 00	
†1	Buffalo	Hornellsville	2	80 / 80	86 / 86	2	Through.	2	90°					120 00	126 00	118 00	110 00	124 50	142 00	117 21	110 00	155 00	
†4	"	"	1	80	86	2	Through.	2	90°					120 00	126 00	115 00	110 00	124 50	142 00	127 91	110 0	155 00	
†21	"	Attica	2	60 / 60	67 / 67	2	Deck.	2	90°		16 ft.	[2]			75 00	81 0	70 0	88 00	83 00	127 48		92 00	
†38	Western	Salamanca	1	120	126	1	Through.	2	90°				69 36	61 00	74 00	58 00	67 0	76 00	71 00	67 99		92 88	
†34	Hawley Branch	Hawley	1	190	198	2	Through.	2	90°				243 65	195 00	f195 00	180 00		240 00	222 00	171 72			
†5	Newburgh Branch	Washingtonville	1	140	146	1	Through.	2	45°				86 10	70 00	83 00	68 00	66 5		85 00	88 43		124 55	

The height from masonry to base of rail given in this table is the maximum height allowable; should the contractor prefer a less depth, the masonry can be adapted to it; when no height is given, the masonry can be varied to suit design. Full diagrams of masonry will be furnished upon the award of contracts

* To be completed January 1, 1874.
† To be completed December 1, 1873.
‡ To be completed November 1, 1873.
§ To be completed July 1, 1874.
[1] Single-track iron Post bridge now standing to be made double-track by addition of two similar trusses, one on each side.
[2] No end posts: bridge seat at upper chord.
a It bid $153 for making this with three trusses instead of two.
b Deep truss.
c Deep truss.
d Also $151 for three trusses instead of two.
e The same for three trusses instead of two.
f Also $185 for three trusses instead of two.
g No. 5 of Delaware Division and No. 25 of Delaware Division are especially deep trusses.

W. Gascoigne; Treasurer, C. Goddard, New York; Attorney and Counsel, W. S. Paddock; Chief Engineer, H. A. St. John.

—The organization of the new medical staff of the Erie Railway has been commenced by the appointment of Dr. James W. Rabney as Medical Director, with headquarters in New York. The surgeons thus far appointed for the Eastern Division are Dr. S Van Etten, of Port Jervis N. Y., and Dr. J. H. Thompson, of Goshen, N. Y. A third surgeon, whose office is to be in Paterson, N. J., is to be appointed. In addition to professional attendance on persons injured on the road, these surgeons will be required to investigate claims for damages on account of injury received, and other similar cases.

—The officers of the Western Illinois Bridge Company, which proposes to build a bridge over the Mississippi at Quincy, Ill., are as follows: President, R. S. Benneson, Quincy, Ill.; Secretary, T. T. Dwight, Quincy, Ill.; Treasurer, Samuel Wood, Quincy, Ill.; Superintendent, Captain M. Piggott, Quincy, Ill.; directors, R. S. Benneson, T. T. Dwight, Samuel Wood, Charles H. Morton, E. H. Turner, M. Piggott, Gustav Levi, James H. Richardson, Henry Meiss r, J. K. Van Doorn, Dr. R. S. McMahan, Quincy, Ill.; M. Logan, R. Drummond, Palmyra, Mo.

PERSONAL.

—Mr. Charles T. Ham, for many years Master Mechanic of the New York Central Railroad, and for a year or more past General Superintendent of the Kelly Lamp Works, of Rochester, has become a partner in the well-known Buffalo Steam Gauge Company, the other members of which are Thomas S. Ray, who has been connected with the manufactory from its establishment in 1860, and Mr. Charles A. Marvin, who entered the firm three years ago.

—Mr. W. L. Bancroft, Vice-President of the Chicago & Port Huron Railroad Company, has started on a visit for Europe, where he hopes to negotiate a loan for his company.

—F. Alexandre, of the New York, Mexican & Havana Steamship Company, has been chosen a director of the Pacific Mail Steamship Company, to succeed George Palmer, resigned.

TRAFFIC AND EARNINGS.

—The earnings of the Kansas Pacific Railway for the second week in August were: passengers, $29.802 99; freight, $40,-755.56; mails, $2 055.31; total, $72 613 85. Of this amount $5,647.38 was for transportation of troops, mails and government freight.

—The earnings of the St. Louis & Southeastern Railway for the week ending August 15 were: St. Louis Division, $15,737.95; Nashville Division, $9,676.13; total, $25,414.08. The earnings of the St. Louis Division for the same week in 1872 were $13,310.53, showing an increase this year of $2,427.42, or 18¼ per cent.

—The earnings of the Great Western Railway of Canada for the week ending August 1, were: 1873, £23,064; 1872, £18,829; increase, £4,235, or 22½ per cent.

—The earnings of the Grand Trunk Railway of Canada for the week ending August 7 were: 1873, £35,700; 1872, £35,000; increase, £700, or 2 per cent.

—The earnings of the St. Louis & Iron Mountain Railroad for the month of July were: 1873, $178,860; 1872, $181,243; decrease, $2,383, or 1¼ per cent. The earnings per mile for the month were: 1873, $619; 1872, $702 For the seven months ending July 31 the earnings were: 1873, $1,343,321; 1872, $1,240,376; increase, $102 945, or 8 5-16 per cent. The earnings per mile for the seven months were: 1873, $4,647; 1872, $5,346; decrease, $699, or 13 1-16 per cent.

—The earnings of the St. Louis & Iron Mountain Railroad for the first week in August were: 1873, $52,350; 1872, $50,583; increase, $1,767, or 3½ per cent.

—Concerning the Lake Superior ore traffic, a correspondent of the Chicago *Tribune*, writing from Marquette, says:

"Last year 952,055 tons of iron-ore, and 57,595 tons of pig-iron were produced in the Lake Superior district, valued at $9,-188,055. Since 1856, at the close of last year, 5,545,413 tons of ore and 351,750 tons of pig-iron had been produced at a valuation of $44,375,053. The present season has hardly realized expectations, yet the total shipments from the Marquette district for the current year, up to July 1, were:

	Iron-ore.	Pig-iron.
Escanaba	251,514	4,275
Marquette	203 147	9,644
L'Anse	23,412	.....
Total	478,103	13,919

"Compared with the corresponding period of 1872, it shows an increase in the aggregate of 110,580 tons this year. Shipments of pig-iron, however, have fallen off about 5,000 tons. For the week ending August 7, the shipments from Marquette amounted to 32,702 tons of iron-ore—over 5,000 tons daily; and, from Escanaba, 23,493 tons.

"It was expected that the total shipments for the current year would approximate 2,000,000 tons; but the decline in the price of iron has considerably lowered this sanguine calculation. The necessity now forced upon the people here is the speedy construction of furnaces and mills for the manufacture of iron."

—The Virginia & Truckee Railroad, from Virginia City, Nevada, to the Carson River, carries ores from the Comstock mine to the mills on that river. During the six months ending June 30, 224 088,500 pounds of ore were transported over the road and 12,096,000 pounds of tailings, in all 16,800 car-loads, or 108 car-loads daily.

—The earnings of the Milwaukee & St. Paul Railway for the third week in August were: 1873, $114,345; 1872, $86,204; increase, $28,141, or 32⅝ per cent.

—The earnings of the Denver & Rio Grande Railway for the second week in August were $8,322.55.

—The earnings of the Denver & Rio Grande Railway for the month of July were: passengers, $20.876.75; freight, $18,735.29; total, $39,612.04, or at the rate of $243 per mile. The earnings of the road for the first week in August were $8,551.34.

—The earnings of the Erie Railway for the second week in August were: 1873, $459,185; 1872, $445,117; increase, $14,068, or 3⅛ per cent.

—The earnings of the Chicago & Northwestern Railway for the second week in August were: 1873, $236,024; 1872, $207,-655; increase, $28,369, or 13⅝ per cent.

—The earnings of the Milwaukee & St. Paul Railway for the second week in August were: 1873, $138,600; 1872, $90,510; increase, $18,090, or 53½ per cent.

CHICAGO RAILROAD NEWS.

Chicago, Rock Island & Pacific.

This company discharged a number of conductors in July for want of business; but now the business has increased so largely that pretty much all of them have been reinstated. The reduction of Iowa rates, which went into force August 15, is the immediate cause of this increase of business, which is taxing the rolling stock of the company beyond its capacity, and has made it necessary to borrow cars of Eastern connections. It is very like spring and fall trade.

Chicago & Alton.

This company is busy settling with the heirs of the deceased victims of the late disaster and paying damages for bodily injuries which are not fatal. In most cases the railroad company finds the parties disposed to be reasonable in their demands. Were it not for the existence of the class of beings called "shyster lawyers," it is quite certain that the company would settle all claims without appeal to the courts. But the shysters have got on the scent of game, as vultures are said to smell carcasses from afar. One of this class of gentry has sent a circular to those poor wounded men lying at the county hospital, telling them how important it is to make this railroad corporation sweat, etc., etc., and also informing the said wounded person that he is just the man to bring the corporation to terms. The utter baseness of such action can only be fully known to those who understand how sedulously the officers of this road have endeavored to do everything in their power to mitigate the effects of the disaster. From the first moment that the news of the catastrophe came to town, the company have spared neither money, time nor pains in the effort to ameliorate, as far as might be, the ills that have resulted from an act for which they were in no respect responsible. The daily press has partly acknowledged this. One of the most unpleasant features of the situation now is, that the disaffected, incompetent discharged men, who have ached for some time to get a chance to strike at the company, have turned newspaper correspondents, and criticise and blame the company simply because they have found an opportunity to vent their spleen. Probably three or four days more will convince the editors of the best managed dailies that these fellows belong to the literary vulture class, like the shysters aforesaid.

The New Freight Law.

A few figures taken from the freight books of the Chicago & Alton road for the month of July furnishes an interesting commentary on the working of the new Illinois railroad law. During that month there were received in Chicago 7,585 loaded cars; and for the same month there were forwarded back into the country 5,394 empty cars. These cars went back empty, simply because the law does not permit the company to carry goods except at the established uniform schedule of rates. The company would have been glad to ship goods from Chicago in these empty cars, even at half the ordinary rates, thus doing a benefit both to the shipper and the country merchant, as well as to the railroad company; but the law prohibits it. This operation of the law is to be seen on every road running out of Chicago; so that shippers are paying not only for hauling their goods, but for bringing the empty cars to the place of shipment. It is hardly possible but that such glaring absurdities in the present law must be repealed at the next session of the Legislature. Another thing which is continually overlooked in the present discussion of the questions of railroad transportation is the difference between what are called "through" trains and way trains. On the Chicago & Alton road, for instance, the through trains are made up at Chicago, Joliet, Bloomington, Springfield, etc. The through trains do not stop at the way stations, except to pass other trains; they roll on day and night to their destination; whereas the way trains stop at every point, leaving cars and taking on others. The famous Lexington case on the Chicago & Alton road assumes a somewhat different aspect when we consider that Lexington is a way station and Bloomington a through station, and that a car loaded at Chicago for Bloomington goes in a through train and is usually unloaded and returned to Chicago before a car which started at the same time from Chicago for Lexington even reaches its destination. In view of such facts, it takes only a little common sense to see that a railroad company could afford to ship to Bloomington at lower rates than to Lexington. When the great questions are all understood of who pays for the trundling of empty cars backwards and forwards, and who pays for the necessary delays caused by the shipment of goods to way stations, much of the difficulty of the railroad war will be removed.

Chicago & Paducah.

A large party of railroad and business men were treated to an excursion on the Chicago & Paducah Railroad, on Wednesday last, from Streator to Windsor, the present southern terminus of the road. Among the excursionists were Superintendent Harris and General Ticket Agent Powell, of the Chicago, Burlington & Quincy road, ex-Lieutenant-Governor Bross, Judge Trimble, of Paducah, the general officers and several stockholders of the Chicago & Paducah Company, and a large number of business men along the line of the road, making in all, a party of over one hundred persons conveyed in three special cars.

The road passes through a portion of the State which is surpassed in fertility, and the managers believe that it will [illegible] the road a large freight business in coal, grain, lumber [illegible] stock. On the day of the excursion, the shippers along the [illegible] asked for 115 cars—more than the company was able to supply; but arrangements are perfected for the rapid increase of rolling stock so as to meet the demand. The road is to be completed this fall from Windsor south to a junction with the Springfield & Illinois Southeastern road; and the Paducah end, as far a Shawneetown, is to be put under contract immediately. The excursion was under the direction of F. E. Hinckley, President of the Company, and Ralph Plumb, Vice-President, and was so managed as to yield a large fund of enjoyment to those who were so fortunate as to be able to go.

Chicago & Northwestern.

This company is reported to have made a special contract with the Diamond Jo Steamboat Company for the transporta-

tion of 150,000 car-loads of grain and merchandise between Fulton, Ill., and Mississippi River ports above, between the 1st of July and the 1st of January next. As this would give something like 900 car-loads daily, it is a pretty hard story to believe.

Illinois Central.

The crops on the Iowa Division, especially wheat, which is the only important export, are very abundant, and the line is likely to need all its rolling stock to carry it in a few weeks.

Personal.

The employees of the locomotive department of the Wisconsin Division of the Chicago & Northwestern Railway presented Mr. W. E. Best, late timekeeper and shop clerk, a watch and chain valued at $300, through Mr. G. W. Tilto , the Master Mechanic, on the afternoon of the 23d.

Chicago, Danville & Vincennes.

This company has recently purchased a tract of 10 acres at the corner of Brown and Sixteenth streets in Chicago, to be used as a store yard for coal. About 100 car-loads of Indiana coal are now brought over the road to Chicago daily.

ANNUAL REPORTS.

Lewisburg Center & Spruce Creek.

This company's road is to extend from the Philadelphia & Erie at Lewisburg Junction, nine miles from Sunbury, Pa., southwest to the Pennsylvania road at Tyrone, a distance of 87 miles. It is in operation from Lewisburg Junction to Mifflinburg, 11 miles.

The operations of the finished section for the year 1872 were as follows :

Earnings :	
From passengers	$10,895 99
Freight	13 40) 18
Mails and express	967 50
Total ($2,297 per mile)	$25 263 67
Expenses (83⅞ per cent.)	21,227 88
Net earnings	$4,035 79

Since the last report contracts have been let for 42 miles of the line, and work is progressing on sections 12 to 35, from Mifflinburg westward, a distance of 24.04 miles, and on sections 86 to 70, from Tyrone eastward, a distance of 18.15 miles. On sections 12 to 35 $113,149.00 has been expended. On sections 86 to 70 $201,330.19 has been expended. Under a former contract work to the amount of $92,869.65 was done on sections 36 to 53, a distance of 17.89 miles, No work is now going on on those sections, it being postponed until the work west from Mifflinburg shall be completed. From Linden Hall (section 53) to Pennsylvania Furnace the road is not yet located.

The road, when completed, will be 87.08 miles long and the estimated cost is as follows :

The 11 miles now in operation	$262,102 39
The 60 084-100 miles now under contract	1,595,700 00
The 16 miles not yet contracted for	348 800 00
Making a total of	$2,206,602 39

or $25,338 per mile.

When the branch to Bellefonte, of 11 miles in length, and the extension to Danville, 15 miles long, are constructed, the company will own 113 miles of railroad.

The subscriptions to the capital stock of the company amount so far to $346,700. Of the two millions of dollars of first-mortgage 7 per cent. bonds which the company are authorized under act of Assembly to issue, $1,500,000 have been disposed of to the Pennsylvania Railroad Company, and $45,000 have been paid over to the Philadelphia & Erie Railroad Company in payment of part of the amount that company advanced in the construction of the line between the Junction and Lewisburg ; there are, consequently, $455,000 of these bonds undisposed of.

Chicago & Michigan Lake Shore.

This company owns a line from New Buffalo, Mich., northward to Pentwater, 170 miles, with a branch from Holland to Grand Rapids, 25 miles, and a branch from Muskegon to Big Rapids, 55 miles, making in all 250 miles of road. The branch to Big Rapids was not completed until after the close of the year, and, we believe, was not opened until just at its close, and the 24 miles of the main line South of Pentwater was not opened until about May 1, 1872, making the average mileage for 1872, 187 miles.

The operations of the road for the year 1872 are reported as follows :

Earnings:	
From passengers	$191.413
Freight	288,874
Mails	4.469
Express	11.576
Miscellaneous	4,853
Gross earnings ($2,679 per mile)	$500,985
Operating expenses and taxes (56¼ per cent.)	282.185
Net earnings ($1,223 per mile)	$218,800

On account of the unfinished state of the road, no fair comparison can be made with the previous year. The mileage of passenger trains during the year was 258 264 miles ; of freight trains, 193,076 miles ; of other trains 31,300 miles ; a total of 482,640 miles.

The equipment of the road consists of 25 locomotives, 12 passenger, 12 baggage, mail and express, 135 box and 470 platform cars, a total of 24 passenger-train cars and 605 freight-train cars. There are also seven road and service cars.

The capital stock is $1,188,400 and the bonded debt $5,350,000, making a total capital account of $6,538,400, or $26,154 per mile. The bonds all bear 8 per cent. interest, making an annual interest charge of $428,000. The net earnings of 1872 were less than this by $209,200, and the company has failed to pay its coupons due in July, 1873.

Springfield, Athol & Northeastern.

This company (formerly the Athol & Enfield) owns a line from Athol, Mass., southward to Barrett's Station, in Palmer, 30.5 miles. An extension from Palmer to Springfield, about 20 miles, is now under construction.

The operations for the year ending July 30, 1873, are stated as follows :

Earnings:	
From passengers	$20,338
Freight	23,716
Mails	1,767
Express	891
Car service	228
Total ($1,211 per mile)	$46 940
Operating expenses (94⅞ per cent.)	44 597
Net earnings	$2,343
Received from stocks and bonds	2 750
Rent of real estate	367
Borrowed of Athol Savings Bank	6.500
Advanced by President	2,792
Total	$14 752
Land damages, interest, etc.	14,752

Of the amount charged as operating expenses, $12,968 was expended in putting the road in repair and completing it.

In reference to the extension from Palmer to Springfield, the report states that the $300,000 subscription by the city of Springfield has been expended in securing the right of way and lands necessary for the building of the road, and in grading, superstructure, besides $25,000 of the bonds upon the extension, leaving $275,000 of the bonds which the company has been authorized to issue upon the extension yet to be disposed of. The report states that freight trains will probably run through to Springfield by October 1.

Los Angeles & San Pedro.

This company owns a line from Los Angeles, Cal., southwest to its port, San Pedro. The line is about 25 miles long.

The report for the year 1872 gives the following figures :

Receipts	$197.978 77
Operating expenses (68⅞ per cent.)	115 791 64
Net earnings	$82,187 13

No statement of equipment is given. The cost of the road is stated at $682,510, of which $64 510 was paid from the earnings of the road. The capital stock is $500,000, of which the city of Los Angeles owns $75,000 and the county of Los Angeles $150,000.

Canada Southern.

The first annual report of this company gives the following statement of the company's present and prospective mileage : The main line from Buffalo to Chicago is 482 miles ; the St. Clair Branch is 62 miles ; the Toledo Branch, 35 ; Toledo to Detroit, 56 ; Erie & Niagara, 31 ; Michigan Midland, etc., 14 ; Welland cut off, 11 ; and the spur from the St. Clair Branch to Petrolia, six miles, making altogether 697 miles.

Of the above there is substantially completed 298 miles of the main line, 56 of the line from Detroit to Toledo, and 28 miles of the Michigan Midland. By the 1st of September 46 additional miles, it is promised, will be completed, making altogether 428 miles.

It is proposed to build a cut-off 11 miles, from the main line 17 miles from the International Bridge, to a point on the Erie & Niagara a mile and a half above the Falls. This will shorten the distance between St. Thomas and all points east, making the line to the Falls 113¾ miles ; to Suspension Bridge, 115¼ ; to the proposed bridge at Lewiston, to connect with the Lake Ontario Shore Line, 132½ ; and to Niagara, 127½ ; and thence by steamer across the lake to Toronto. Westward from St. Thomas there are two lines. By the St. Clair Branch the distance is 66½ miles to the terminus at Courtright, thence by a ferry to St. Clair city, thence by the Michigan Midland to the Grand Trunk Junction at Ridgeway, 14 miles, and thence by Grand Trunk to Detroit, 41 miles—the entire distance from St. Thomas by this route being thus 123 miles. The other route is by way of Amherstburg, 111 miles, thence by the Toledo, Canada Southern & Detroit Railroad to Detroit, say 15 miles, making the journey by this route to Detroit 126 miles.

There has been some unexpected delay in the completion of the International Bridge at Buffalo, which, however, will probably be opened in October. In the meantime an arrangement has been made with the Great Western Railway Company for the use of the suspension bridge for the passage over it of the through traffic of the Canada Southern, and the company will avail itself of these facilities until other means of transit across the Niagara are provided.

The liabilities created by the construction of these lines of railway are stated to be as follows :

	Stock.	Bonds.
Canada Southern, including advances to Erie & Niagara and Detroit River Railway & Bridge Company and the ferry boat	$7,600,000	$3,250,000
Chicago and Canada Southern, including advances to Detroit River Railway & Bridge Company	2,225,000	2,760,000
Toledo, Canada Southern & Detroit	1,250,000	1,000,000
Michigan Midland	225,000	225,000
Total	$11,300,000	$12,235,000

A total of $23,535,000. At the recent annual meeting the stockholders voted unanimously in favor of increasing the capital stock by $5,000,000, in accordance with the powers conferred by the charter.

THE SCRAP HEAP.

Watches for Locomotives.

A correspondent of the Chicago *Tribune* says :

"The Pennsylvania Railroad have for years made a first-class watch a part of their engine equipment. Every engine upon the road has its watch numbered to correspond with the number upon the engine. The watches are purchased by the company, and controlled by the proper officers. In the office of each Division Superintendent hangs a watchmaker's board with numbered hooks for all the watches and engines belonging to that division. When an engine goes out upon a trip the watch is taken from the hook. When it returns, the watch is replaced, and while in the office is run with the regulator. As a consequence, all the engines upon the road are being run upon a uniform time, and no record has yet been made of an accident resulting from a discrepancy of watches."

Another correspondent says :

"The English railways furnish their officials with Frodsham's chronometers, locked up in a wooden or tin case, and which are the property of the railway, secured by a deposit for its safe return. The chronometer is delivered at the end of each journey by its custodian, who does not hold the key of its box, to the time-keeper, who is responsible for the time."

Vienna Premiums for American Tools.

Among those who have received premiums for machinery at the Vienna Exhibition are Messrs Wm. Sellers & Co., of Philadelphia ; J. A. Fay & Co., of Cincinnati (for wood-working machinery) ; Jones & Laughlin, of Pittsburgh, for shafting.

Railroad Manufactures.

The Buffalo Steam Gauge Company is filling a second order for 1,000 gauges for the Westinghouse Air Brake Company. Besides gauges, the company turns out from 40 to 50 headlights monthly, besides lanterns, cab lamps, &c.

Prices of Rails in Belgium.

On the 23d of July the Belgium Government let contracts for large quantities of steel and iron rails. The lowest bidder for steel rails was Messrs. Schneider, of Creusot, France, at 452.97 francs per ton. The lowest English bid was 458 francs, and the lowest Belgian bid considerably higher, so that all the lettings were to French and English bidders. At the last letting, on the 19th of March, 495 francs was the lowest bid. For iron rails two firms (French and Belgian) offered 280 francs per ton, and the others at 282.50 to 294.50. The lowest bid in March was 316.80. Thus we see a decrease of prices amounting to 42 francs on steel rails and 36.80 on iron—8½ and 13 per cent. —within four months. Bids for re-rolling old rails were made at rates (so many pounds of old rails for a ton of new) which put the price of old rails at 165 to 170 francs, but in money there was no offer of more than 135 francs per ton.

The Belgian iron masters are suffering greatly from the very high price of coal.

Trial of a Fireless Locomotive.

The Chicago *Tribune* gives an account of a trial of Myers & Lamm's "fireless locomotive," at Hyde Park, near that city. The engine and its appliances are thus described : "At the depot was a supply boiler, 16 feet by 3 feet, in which steam was generated until 200 pounds pressure was indicated by the steam-gauge. The locomotive boiler was three-fourths full of cold water. Instead of boiling this by means of a fire, and raising the pressure to the required height, the heat was introduced from the supply boiler through an iron tube. This iron tube was connected with a tube in the locomotive boiler, the latter running under the water along the bottom of the boiler and letting out the superheated steam as it was freed from the supply boiler into the locomotive boiler. This steam, rising through the cold water, permeated it, and quickly raised its pressure to 170 pounds. With this supply of steam the locomotive started, drawing a heavy four-horse car over the three miles to Thirty-fifth street in ten minutes. The amount of steam consumed was 80 pounds, the locomotive starting back with 90 pounds remaining. When the starting point was reached there was 57 pounds of steam in the boiler, the pressure being reduced only 33 pounds in the return trip, which was down grade. It must be borne in mind that there was a large car, heavily laden, making eighteen miles an hour."

It is stated that a stock company has been organized, with r. J. E. Young—General Manager of the Chicago, Danville & Vincennes Railroad—as President. This company control the patents, and has made a contract to replace the Hyde Park dummy-engines with three fireless-engines. It agrees to run cars every twelve minutes, instead of every hour as heretofore.

Mr. Lamm is, we believe, the gentleman who introduced the same class of engines on some of the railroads in New Orleans, and Mr. Myers was concerned in an engine to be worked by compressed air, which was tried in Chicago about two years ago, and was described in the RAILROAD GAZETTE about that time, but was soon after burned in the great fire.

OLD AND NEW ROADS.

New York Central & Hudson River.

The freight conductors and brakemen on the Western (Buffalo) Division struck on August 19. They struck last month for the same wages received by the freight conductors and brakemen on the Middle Division, and, it is reported, were promised that their demands would be complied with. The pay promised was, for conductors $55 per month for the first year and $60 for the second ; for brakemen, $45 per month. For doubling the road both parties were to receive pay for one and one-half days, and for trebling two and one-half days. When paid off the conductors received $1.35 for going over the the road once, and the brakemen $1, making their wages considerably lower than promised. They have now demanded for conductors $90 per month, standing wages, and for brakemen $70.

Later advices state that the strikers had all been discharged and new men hired in their places. Some delay in the movement of freight was caused by the strike.

La Crosse Bridge.

Mr. Anthony Jones, the engineer in charge of the preliminary surveys, has completed his work and submitted the plans to the officers of the Bridge Company and the Southern Minnesota Railroad Company. The principal features of the plan for the bridge and the tunnel which is to constitute the eastern approach are as follows : The total length of the tunnel will be 2,600 feet. The total length of the bridge will be 4 035 feet. There will be two abutments on Front street, La Crosse, five piers in the main channel, and seven piers in the west channel. Over Front street there will be an iron span of 25 feet. Over the main channel there will be, first, an iron span of 100 feet clear of opening ; an iron draw span of 360 feet ; and two iron spans of 250 and 220 feet respectively. Then comes the trestle work, 1,980 feet across the island. Over west channel are four spans of Howe truss of 160 feet each clear opening, and two ditto of 167 feet each clear opening. The entire structure is to be a first-class work in every particular.

Meetings.

The regular semi-annual meeting of the General Passenger and Ticket Agents' Association will be held at the Grand Pacific Hotel in Chicago, September 19.

New Line to the Hoosac Tunnel.

It is stated that a party under the direction of the Delaware & Hudson Canal Company is at present engaged in surveying a route from Schenectady through Mechanicville and Jonesville to Stillwater, at which place it is to cross the Hudson and proceed to the Hoosac Tunnel. As now determined the line leaves the Schenectady Branch at a point nearly two miles south of the branch, passes through the old academy grounds at Jonesville, then by a northeasterly curve comes upon the Saratoga Branch near Round Lake. It follows the old track to Mechanicville, then leaving it strikes across to Stillwater.

New York, Philadelphia & Washington.

This is the name of the company which was recently organized to build a railroad from Camden, N. J., northwest 23 miles to Bordentown, there to connect with another projected line from Bordentown to South Amboy. Several of the directors are, or have been, connected with the New York, West Shore & Chicago.

Northern Pacific.

A recent Washington dispatch says : "The treaty just negotiated with the Mountain Crow Indians of Montana by Peace Commissioner Brunot, and by which Indians change their reservation on the Yellowstone for a much smaller one on the Missouri, is one of the most important which has been made with the Indians for a long time. The abandoned reservation contains more than 6,250,000 acres, and will be traversed through its entire length, nearly 250 miles, by the Northern Pacific Railroad, which, now that Indian title is extinguished by the voluntary withdrawal of the Indians, will be entitled under its charter to receive grants of alternate sections for 20 miles each side of its line, equivalent to a tract of nearly 3 000,000 acres of land. Mr. Brunot was, until recently, and, so far as it is known, now the owner of 113 shares of the Northern Pacific Railroad stock."

Valley, of Virginia.

The engineers are at work laying out the sections of the contractors through Rockbridge and Botetourt counties, south of Staunton. The contractors are already on the ground.

New Orleans, Little Rock & St. Louis.

This company agrees to build the section of 40 miles from Shreveport, La., northeast to the Arkansas line this year, provided Shreveport votes the subscription asked for.

Delaware, Lackawanna & Western—Morris & Essex Division.

Mr. James Archbald, Chief Engineer of the road, furnishes us with the following brief description of the new tunnel through Bergen Hill and its approaches.

The eastern approach will begin in the present yard at Hoboken and will ascend with a grade of 31 feet to the mile to the Erie branch line to the Weehawken oil docks, which will be crossed at an elevation of 20 feet. From this point to the western end of the tunnel the grade will be 15 feet to the mile ascending westward. All the streets will be crossed by iron bridges.

The tunnel proper will begin under the trestle work of the West Hoboken horse railroad, three-quarters of a mile north of the mouth of the Erie tunnel, and will run in a straight line through the hill, the western end being about 150 feet north of the west end of the Erie tunnel. The tunnel will be divided

into two parts, the eastern portion being 2,200 feet long and the western 1,750 feet. The tunnel will be built for double track and will be 27 feet wide and 20 feet high in the center. The two portions will be separated by an open cutting 300 feet long, which will be of service for ventilation. A signal station will be established here and also a depot for traffic from Jersey City Heights. About 600 feet of the tunnel, it is thought, will require arching, the rest being through solid rock.

West of the tunnel the road will cross the Erie on a bridge and the Midland at grade. The road will descend with a grade of 26 feet to the mile, and will cross the Hackensack on a new bridge about 1,000 feet south of the present one, and will pass thence across the meadows, meeting the old line about a mile west of the Hackensack. From Hoboken to this point the road will be a straight line and some 3,500 feet shorter than the present line.

The connection of the Boonton Branch with this line is made by a line from a point near where the tunnel line crosses the Erie Railway to a point on the Boonton Branch, about a quarter of a mile east of Penhorn draw-bridge. The grade of this connection will be 26 feet per mile ascending east. Most of the Boonton Branch connection will be on trestling, ranging from six to twenty-five feet in height.

The work on the tunnel will be driven by twelve shafts, thus giving fourteen headings from which the works can be pushed forward at one and the same time. The shafts will be eight by sixteen feet, the deepest of which will be 91 feet. The openings or mouths of the tunnel are to be constructed of cut stone masonry.

The contract for the tunnel proper has been awarded, as previously noted, to Mr. John McAndrews, of Scranton, Pa. The work is to be completed in 21 months. The amount of the contract is about $800,000. The contract was signed August 27. The contracts for the approaches have not yet been awarded. It will probably be at least two years before the tracks are laid and the new road ready for use.

Cincinnati & Terre Haute.

Terre Haute (Ind.) papers state that this road has been leased to the Terre Haute & Southwestern Company, and that the latter company has already taken possession. The terms of the lease are not stated. The Cincinnati & Terre Haute road is intended to run from Terre Haute southwest to Cincinnati, and has been for some time in operation from Terre Haute to Middlebury, 27 miles. Some grading is done beyond that point, but work has been suspended for over a year. The Terre Haute & Southwestern Company intends to construct a line from Terre Haute southwest to Tamaroa, Ill., to connect with the Iron Mountain, Chester & Eastern. A contract was let some time ago, but we are not aware that any work has been done.

Montclair.

Work is slowly proceeding on a short extension from the present terminus at Monk's' to the Long Pond Furnace. This extension will be used mainly for hauling iron and ore from Long Pond to the works at Ridgewood. No work is now being done on the proposed extension from the Furnace along the bank of Greenwood Lake, and probably none will be done until the financial affairs of the company are settled. The extension will require some very heavy work.

Michigan Central.

The new depot of this company in Jackson, Mich., is completed. The building, which fronts on Main street, is 294 by 42 feet. The central portion of the building is devoted to a general reception-room. 38x72, and a ladies' reception-room, 38 x58. Near the west end is the telegraph office, 20x28, with the completest equipments. Near the middle of the building, on the south side, is the ticket office, 18x14. The building is handsomely fitted up and the exterior has a pleasing architectural effect.

Kansas City & Lawrence.

A proposition to vote bonds for a railroad from Kansas City, Mo., to Lawrence, Kan., was voted on in Jackson County, Mo. (the county in which Kansas City is situated), August 22, and defeated.

Toledo Union Bridge.

A company known as the Union Bridge Company has been organized at Toledo, Ohio, and has obtained permission from the Board of Public Works of that city to build a bridge over the Maumee River from a point on the present railroad grounds a short distance below the Lake Shore bridge to a connection with the Toledo, Tiffin & Eastern road, on the east side. The bridge will enable direct connection to be made between all the roads entering the city. The stockholders in the company are the Toledo, Wabash & Western Railway Company, the Canada Southern Railway Company and the Pennsylvania Company.

The Boston & Maine and Eastern Controversy.

The Boston & Maine Company recently purchased Smith's Wharf in Portland, Me., to reach which it was necessary to cross the track of the Eastern Railroad on Commercial street. August 23, the Boston & Maine officers sent notice to the Eastern that on the next day (Sunday) they should put down a cross frog at the head of Smith's wharf, recently purchased by the company. The frog was carried to the spot late on Saturday evening. At midnight the Eastern Railroad and Maine Central Railroad attached two engines to a train of twelve cars and had the train moved down Commercial street to the point where the Boston & Maine proposed to cross the track, there to remain until nine o'clock the next day. No demonstration was made by the Boston & Maine. The Grand Trunk Company usually occupied the track during the day, but that road allowed the Eastern to occupy it. The Eastern claims to exercise control over a portion of Commercial street, because it helped to build the street and made a special contract with the city. It claims that the building of the Boston & Maine to Smith's Wharf would obstruct it in making up trains and in other ways.

Atlantic & Pacific.

A report comes from St. Louis to the effect that Mr. Robert E. Carr, President of the Kansas Pacific Railway Company, is to be made Managing Director of the Atlantic & Pacific, and that there is to be a practical consolidation of the interests of the two companies.

Protecting River Banks at Omaha.

It is stated that the Chicago & Northwestern, Chicago, Rock Island & Pacific, Kansas City, St. Joseph & Council Bluffs, Burlington & Missouri and Union Pacific railroads, which own depots at Omaha and Council Bluffs, have united for the purpose of riprapping the Missouri River between those two cities, and below the latter city, similar to the works near St. Joseph, Mo., for the purpose of protecting the depots and tracks along the river. At the last rise of the river it made considerable into the Nebraska and Iowa shores, and the proposed work appears to be of great necessity. The work will be pushed along until winter, and then will be rushed along when advantage can be taken of the ice.

Wisconsin.

Mr. John W. Cary, President of this company, which was organized to take the St. Croix land grant and build the roads required, made recently a statement to the Milwaukee *News* of the present position of the company. He stated that the Wisconsin Railway Company had tendered to Governor Washburn a bond of $125,000 that they will construct the road according to the requirement of the statute. The former offer of the company was a penal bond of $300,000 to hold the State harmless as against all damage which it might incur by reason of a failure of the company to build the road. The bond now offered is for liquidated damages, as required by the Governor, or, in other words, it is a confession of judgment by the signers of the bond that they will pay that amount of money into the State treasury in case the company fails to build the road, whether the State gets the land grant or not.

Texas & Pacific.

On the Transcontinental Division track has been laid from Sherman eastward [illegible] miles.

On the line from Jefferson to Texakana the track-layers have reached a point 16 miles north of Jefferson and seven miles beyond the last point noted.

The shops at Marshall are rapidly approaching completion and the removal of the machinery from the old shops at Hallville to Marshall has been commenced.

The transfer of the franchises and property of the old Transcontinental Company to the Texas & Pacific has been finally completed. The consideration was $1,000,000 in Texas & Pacific bonds.

Peoria & Springfield.

This company's line has been completed and in operation for some little time from Peoria, Ill., to Pekin, 10 miles. From Pekin to Antioch, 36 miles, the road is to be finally located this fall and grading commenced early in the spring. From Antioch to Springfield arrangements have been made to use the track of the Springfield & Northwestern road, which is now nearly completed.

Mineral Range.

This road is nearly completed for eight miles northward. At the eighth mile track-laying will be stopped until further sales of bonds are made. The road is graded nearly to Calumet, 12½ miles from Hancock. A locomotive and six flat cars are in use.

Pacific, of Missouri.

An injunction restraining the city of St. Louis from further interfering with the track on Poplar street leading from the depot to the levee, or from preventing the use of the track by the Missouri Pacific or Atlantic & Pacific companies, was granted by the Circuit Court at St. Louis, August 19. Under cover of this injunction the track torn up by the city authorities was relaid August 20, again putting the road in communication with the river. A motion to dissolve the injunction was made, but argument on it was postponed to September 15.

Western Illinois Bridge Company.

A company by this name has been organized to build a new railroad and highway bridge over the Mississippi River at Quincy, Ill. It is intended to construct the bridge just below the city to an island near the Missouri shore, from which island it will be carried to the west bank on trestle work. It is to be free to highway travel and open to any railroad company desiring to make connections across it. It is reported that the company has received promises of support from railway interests.

There is already a bridge across the river at Quincy, which is under the control of the Chicago, Burlington & Quincy Company.

St. Joseph & Denver City.

In a recent notice of the proposed issues of new bonds we gave the total increase of debt as $6,300,000. In this we neglected to observe that the $1,300,000 of the new issues were to be applied to the retiring of the present debt, the statements of the issues proposed being made in such a mass of verbiage as make it difficult to discover just what was meant. But this increase would make the total debt of the company $12,000,000, which would be secured by the land grant and 263 miles of road, so that the debt would be at the rate of $45,627 per mile of road, the interest on which could not be paid without earnings much larger than those of any railroad west of the Mississippi.

A meeting of the bondholders of this company, called by the Protection Committee appointed at a former meeting, was held at the office of Hassler & Co., 11 Wall street, New York, August 26.

The bonds represented at the meeting amounted to about $4,000,000.

After the report of the Committee *ad interim* was read to the assembly, the following resolutions were passed:

"*Resolved*, That a committee of five be appointed, consisting of Charles W. Hassler, Chauncey Vibbard, J. F. Navarro, J. Aug. Johnson and F. Kingman, to be a committee to protect and promote the interests of subscribing bondholders, and they are hereby authorized and empowered to procure the foreclosure of either or both mortgages, and to cause the railroad and other property secured thereon to be sold for the benefit of said bondholders, and to act generally in their behalf in respect to negotiations with other roads, the appointment of a receiver under a different management, as the said committee under the advice of counsel shall deem best for the said bondholders; that the committee have power to fill its own vacancies, the retiring member having the right to vote for his successor.

"*Resolved*, That subscribing bondholders be assessed one per cent. on the amount of their holdings to cover the necessary expenses in such proceedings pursuant to the recommendations in the report of the Protection Committee."

Detroit, Eel River & Illinois.

A dispatch from Fort Wayne, Ind., states that an agreement has been entered into between the Fort Wayne, Jackson & Saginaw and the Detroit, Eel River & Illinois railroads, whereby the former company gives the use of six miles of their road, from Auburn Junction, Ind., to Waterloo, Ind., thus enabling the latter road to make through eastern connections with the Lake Shore & Michigan Southern Railway. The Detroit, Eel River & Illinois has been entirely cut off from direct eastern connections since the failure of the proposed consolidation of that road with the Detroit, Hillsdale & Indiana and the Fort Wayne, Jackson & Saginaw roads.

It has previously been reported that the Detroit, Eel River & Illinois Company was constructing a track of its own from Auburn Junction to Waterloo.

Chicago, Millington & Western.

The surveys for this narrow-gauge line have been completed to the Mississippi River, and the engineers are now engaged in mapping out the route.

The Tax on Dividends.

In the case of the Philadelphia & Reading Railroad Company *versus* J. B. Kenney, Collector of Internal Revenue, Judge M'Kenna, of the United States Circuit Court in Philadelphia, filed an opinion, August 21, deciding that under the provision of the act of July 14, 1870, a dividend declared on the 30th of November of that year and payable on the 27th of December of the same year is not liable to tax to the United States. That act is limited in its operation to August, 1870, and the new tax was not imposed upon interest and dividends during the remainder of that year or until the year 1871. In other words, interest and dividends declared and payable during the last five months of 1870 are exempt from taxation. The case was an action of trespass for alleged illegal seizure and detention of goods and chattels of the plaintiff. The defendant alleged justification in making the seizure, because plaintiff, on the last day of November, 1870, declared a dividend of $1,570,580 61 on its capital stock, as part of its earnings between July 1, 1870, and November 30, 1870, and that plaintiff was liable to United States tax of two and a half per cent.

Milwaukee & St. Louis Air Line.

Arrangements have been completed for the consolidation of the Milwaukee & Northern Illinois and the Varna, Peru, Mendota & State Line Railroad Companies, under the above title. The new company is to build a line from Milwaukee southwest to a junction with the Western Division of the Chicago & Alton. The partially graded road-bed of the old Milwaukee & Beloit road is to be used.

Chicago, Augusta & South Atlantic.

A convention is to be held in Chicago, October 9, to devise means for forwarding the construction of this projected line, which is to connect Chicago with Augusta, Ga.

Cairo & St. Louis.

A large amount of iron is being landed at Cairo for this road. The company recently paid duties on iron to the amount of $25,000.

Minnesota & Northwestern.

The bonuses asked for on this road, from Wells, Minn., to Mankato have been raised, and work is to be commenced at once.

Toledo, Wabash & Western.

This company has reduced its through rates from Springfield, Ill., to New York, the rate now being 48 cents per 100 pounds on first and second class, 36 cents per 100 on third and fourth class, and 30 cents per 100 on special. It is stated that other reductions are shortly to be made.

Southern Minnesota.

Reports are afloat that steps will shortly be taken to take this road out of the hands of the Receiver and to extend it westward from Winnebago, Minn., to a junction with the Sioux City & St. Paul near Heron Lake, about 60 miles.

Grand Junction.

The surveying parties are at work running a line for this projected road from Quincy, Ill., eastward through Mount Sterling and Beardstown to Mason City.

Cincinnati, Lafayette & Chicago.

About 20 car-loads per day of stone for the new Government buildings at Chicago now pass over this road.

Marquette, Houghton & Ontonagon.

A correspondent of the Chicago *Tribune* writes of this road:

"Settlers are crowding into the mineral range so rapidly that the 62 miles of new railroad between Marquette and L'Anse are reaping a summer passenger traffic that taxes the utmost capacity of the company.

"This Marquette, Houghton & Ontonagon Railroad is remarkably good property. Its construction was no light undertaking. Some of the grades are astonishing, but they are mainly utilized. At the western end, a rise of 1,100 feet above the bay at L'Anse is overcome within 10 miles—a portion of the grade being 207 feet to the mile. Similar heavy grades characterize the Marquette end; but, as the east and west termini are the shipping points, the down grades are utilized in the easy transportation of trains of forty or fifty loaded cars on to the vast ore docks; and, as comparatively light trains only ascend the grades, the whole line can be very economically worked.

"A few years ago, this railroad, with its charter and the twenty or thirty miles completed, could have been bought dirt-cheap. Four millions would not pocket it now. In addition to its splendid traffic, the company has a valuable land-grant, portions of which have appreciated with Chicago rapidity. The quality of the ore contained regulates its value. Explorers find it a tempting field. For each discovery of No. 1 hard or rock ore, either specular or magnetic, on railroad land, the company offers $5,000 reward. This corporate desire to share in the natural profits extends to the individuals. None of the officers are poor men, neither are they dependent upon their salaries. They are too deeply interested in the largest mines to quibble about compensation."

Milwaukee & St. Paul.

Reports received from all or nearly all the stations on this company's lines in Wisconsin, Iowa, Minnesota and Illinois show that almost everywhere the wheat crop, which is the very life of trade and traffic in these districts, is good, and assure a large traffic for the coming season, which will be much larger in a westward direction, if good prices are obtained for the grain. The company is adding 20 locomotives and 500 freight cars to its rolling stock.

Peoria, Atlanta & Decatur.

The Peoria (Ill.) *Transcript*, of August 21, says: "About two miles and a half of track is laid on the Peoria, Atlanta & Decatur Railway, and Mr. Hitchcock, President of the road, still hopes to push matters so that the line will be in running order from this city to Atlanta before the State fair. The contractors have suffered in various ways, the chief being in the forwarding of material, but the Toledo, Peoria & Warsaw folks have this week unloaded sixty-three car loads of materials for the road at its junction with their line, and the delay from that cause is ended."

Illinois & St. Louis Bridge.

A board of engineer officers, to consist of Col. James A. Simpson, Major Godfrey Weitzel, Major Wm. E. Merrill and Major Charles R. Suter, has been appointed by the Secretary of War, to meet at St. Louis on the 2d of September, or as soon thereafter as practicable, to examine the construction of the bridge across the Mississippi at St. Louis, and report whether the bridge will prove a serious obstruction to the navigation of the river, and if so in what manner its construction can be modified.

Iowa, Minnesota & North Pacific.

A special meeting of the directors was to be held in Newton, Ia., August 26, to consider some important propositions.

Green Bay & Lake Pepin.

The grading is now completed to a point about ten miles from Winona, Minn., and is making steady progress. The track is laid for fifteen miles westward from Merrillan, Wis., the late terminus. It is expected that trains will run into Winona by the middle of October. The line has been changed so as to pass through the village of Arcadia, the company receiving a donation of 100 acres of land in addition to a bonus of $50,000 already voted by the township.

Winona & St. Peter.

The western extension of this road is now completed to its terminus, Lake Campeska, which is in Dakota, some 27 miles west of the Minnesota line. The contractors have finished their work and withdrawn their working parties from the line.

Grand Trunk.

This company advertises for proposals to purchase the wooden side-wheel steamer "International," having a deck capacity of 14 cars. The boat is now used as a ferry boat between Buffalo and Fort Erie, and will be ready for delivery to the purchaser at Fort Erie upon the completion of the International Bridge, in October next. Proposals are to be addressed to C.

J. Brydges, Managing Director, Grand Trunk Railway, Montreal, Canada.

Easton & Amboy.

A large force is at work on the tunnel at Pattenburg, N. J., and work goes on day and night. It is stated that the heading is in about 1,100 feet from the mouth of the tunnel. The tunnel is nearly a mile long.

Sugar River.

The town of Claremont, N. H., at a recent town meeting voted, by a decided majority, to instruct the selectmen to issue town bonds not to exceed $400,000 as a donation to the Sugar River Railroad, which action settles the long-standing difficulty between the road and the town.

Sussex.

It is reported that this company is having surveys made for a branch line to or toward Belvidere, N. J., running down the Green Pond Valley and parallel to the line which the New Jersey Midland engineers are running through the Pequest Valley.

Olympia.

A company by the name of the Olympia Railroad & Mining Company has been organized to build a railroad from Tenino, Washington Territory (25 miles below the Puget Sound terminus of the Northern Pacific), to Olympia, a distance of about 20 miles. The capital stock is to be $1,000,000, and the headquarters of the company are in San Francisco.

Atlantic & Great Western.

The Meadville (Pa.) *Republican* states that the offices of the General Passenger Agent and the General Freight Agent are to be removed from Meadville to Cincinnati about September 8.

Snow Hill, Greenville & Goldsboro.

The last Legislature of North Carolina granted a charter for this road, which is to extend from Goldsboro, the junction of the North Carolina, Wilmington & Weldon and Atlantic & North Carolina roads, about 35 miles east by north to Greenville, on Tar River. It is now proposed to build a light road with wooden rails. The line passes through a very fair section of country with a considerable farming population.

Buffalo & Jamestown.

The track is laid to a point near Taylor's Hollow, N. Y., 10 miles beyond the late terminus at Eden Center and 29 miles from Buffalo. This makes about 25 miles of track completed by the company, which uses some four miles of the Buffalo, New York & Philadelphia road out of Buffalo.

Washington City, Virginia Midland & Great Southern.

A supply of iron has been received and tracklaying has been recommenced on the extension from Lynchburg, Va., to Danville. It is said that the work will now continue without interruption.

Beaumont, Corsicana & Fort Worth.

This company was organized at Corsicana, Tex., August 13, under a charter granted by the Legislature of Texas at its last session. The road is to extend from Beaumont, on the Sabine River, northwest to Fort Worth, the junction of the main line and Transcontinental Division of the Texas & Pacific, and would be about 275 miles long.

Greenville, Columbus & Birmingham.

Washington County, Mississippi, recently voted to subscribe $250,000 to the stock of this company. The road is to extend from Greenville, Miss., on the Mississippi River, nearly due west to Birmingham, Ala.

Houston & Texas Central.

The Galveston (Tex.) *News* of August 21 says: "The Central Railroad trains have ceased to run to Red River City, some four miles beyond Denison, and now stop at Denison. The public will be glad to see that the rivalry between those two cities is now at an end, for, like some other rivalries, it was not only damaging to the public but to the parties themselves."

Denison is the terminus of the Missouri, Kansas & Texas road, but the Houston & Texas Central Company selected Red River City as their terminus, and there has always been trouble between the two companies on this point. The tracks of the two companies between the two places are parallel and, we believe, close together.

International & Great Northern.

Stock-yards have been built at Jewett, Tex., which is on the International, 47 miles southwest of Longview, and it is to be made a shipping point for cattle.

Northwestern Union.

The stations on this new road, with the distances from the depot on Wisconsin street, Milwaukee, are as follows; Granville, 13.86 miles; Germantown, 20.62; Jackson, 25.73; West Bend, 32 83; Kewaskum, 40.41; New Cassell, 46.60; Eden, 54.27; Fond du Lac Junction, 61.47; Fond du Lac, 62 22. From the Wisconsin street depot to the junction with the Chicago & Northwestern track in Milwaukee, the distance is 1.14 miles, making the length of the road 63.36 miles.

Regular trains will commence running September 1. The road will be formally opened by an excursion from Milwaukee to Fond du Lac August 30.

Halifax to San Francisco.

The New York *Tribune* of recent date says:

"The Intercolonial Railway, between Halifax and St. John, which will complete a through railroad route from Halifax to San Francisco, is almost finished, and on Thursday of last week the general baggage agent of the European & North American Railway shipped a small trunk from Halifax to San Francisco, from which place it is to be returned, thus significantly announcing the establishment of an all-rail line of communication between those two cities. The agents of all the railroads on the route it was to take were informed of the fact, and requested to forward it as rapidly as possible. The trunk was to be checked with the Intercolonial Railway check No. 4,196. It is so constructed that letters can be put in, as in a letter-box, but cannot be taken out, and among its collections as it travels will be all the railroad time tables, passes, names of the principal stations, and such other contributions as the railway officers may see fit to insert. On its arrival in San Francisco it will be placed on exhibition in the Board of Trade rooms. One section of it will then be opened, and a canteen containing water taken from the Atlantic Ocean will be taken out. On setting out for its return the canteen will be filled with water from the Pacific Ocean, to be carried to Halifax. The route of the trunk will be over the Intercolonial Railway from Halifax to St. John, the European & North American to Bangor, the Maine Central to Portland, the Eastern to Boston, the New York, New Haven & Hartford to New York; the Pennsylvania to Pittsburgh; the Pittsburgh, Fort Wayne & Chicago to Chicago; the Chicago, Burlington & Quincy to Burlington; the Burlington & Missouri River to Omaha, and the Union and Central Pacific to San Francisco."

Fall River, Warren & Providence.

The Fall River (Mass.) *News* says: "The Fall River, Warren & Providence Railroad was sold last spring to the Boston & Providence Railroad. Recently an arrangement has been made between the Boston & Providence and Old Colony railroad corporations, whereby the Fall River, Warren & Providence Railroad is to become the property of the Old Colony Company, on the latter building the proposed bridge across the river near Slade's Ferry, and also building a road to connect with the Fall River, Warren & Providence road."

The Fall River, Warren & Providence road is 5¾ miles long and extends from a point on Taunton River, opposite Fall River, westward to a junction with the Providence, Warren & Bristol road at Warren, R. I. The bridge to be constructed over the Taunton River at Slade's Ferry is about a mile above the city of Fall River, and the connecting line to be built by the Old Colony Company is about two miles long.

Pittsburgh, Wheeling & Kentucky.

Ohio County, West Va., in which Wheeling is situated, voted August 19 to make the additional subscription asked for to the stock of this company. The work of grading will now be pushed forward rapidly until it is completed from Wheeling northward to the junction with the Pittsburgh, Cincinnati & St. Louis. The latter company, we believe, is to iron and operate the road when the grading is completed.

Evansville & Owensboro.

A company has been organized to build a railroad from Evansville, Ind., eastward up the Ohio to a point opposite Owensboro, Ky., a distance of about 30 miles.

Boston, Clinton & Fitchburg.

There are reports that negotiations are going on for a lease by this company of the Vermont & Massachusetts road. The latter company owns a line from Fitchburg westward to Greenfield and also operates the Troy & Greenfield road (which belongs to the State) from Greenfield to the Hoosac tunnel. The Boston, Clinton & Fitchburg line extends from Fitchburg southeast to South Framingham, from which its trains run to Boston over the Boston & Albany road.

The company has made a contract with the Philadelphia & Reading Company by which coal delivered by the latter company's vessels at New Bedford is carried over the Boston, Clinton & Fitchburg's lines to Lowell, Fitchburg and other northern points.

Shenandoah Valley.

The Harrisonburg (Va.) *Register* states that the North River Railroad has been absorbed by the Shenandoah Valley Railroad. The new road—the consolidated Shenandoah Valley and North River roads—is to be called the Shenandoah & Ohio River Railroad, and will be continued from Bridgewater on to the Ohio River. The right of way to the Ohio River has been secured except at three or four points. The road will run through Briery Branch Gap, and strike the coal and iron fields of West Virginia. Two large engineer corps are to be put on the Shenandoah & Ohio by September 1, and the road constructed as speedily as possible.

The Shenandoah Valley Company is constructing a road down that valley, which is to extend from a junction with the Martinsburg & Potomac road to some point on the Chesapeake & Ohio. The North River Company lately commenced work on a short line running diagonally across the valley from Bridgewater to Port Republic.

St. Louis to St. Paul.

Through cars are now run from St. Louis to St. Paul, Minn., by way of Ottumwa and Mason City, passing over the St. Louis, Kansas City & Northern to Ottumwa, the Des Moines Valley to Eddyville, the Central of Iowa to Mason City and thence over the Milwaukee & St. Paul. The distance by this line between the two places is 588 miles.

New York & Long Branch.

The work on this line is progressing rapidly. The northern section of the line, from the junction with the New Jersey Central near Elizabethport to Perth Amboy, is to be completed in the middle of September, and the company expects to have the line open to Long Branch in time for the summer travel next year.

Chicago & Lake Huron.

This company, formed by the consolidation of the Port Huron & Lake Michigan and the Peninsular companies, has filed the necessary papers with the Secretary of State of Indiana. The authorized capital stock of the new company is $10,000,000, of which, however, but $5,000,000 is to be issued at present.

By the last statements published the authorized capital of the Peninsular Company was $4,000,000, of which $1,995,000 was paid in. The whole amount of bonds authorized was $3,800,000, of which $2,779,000 was issued. The capital stock of the Port Huron and Lake Michigan was $1,200,000, of which $84,000 was paid in and the amount of bonds issued was $551,000, of an authorized issue of $1,800.000. The actual capital account of the two companies was thus $5,409,000, of which $2,079,000 was stock and $3,330,000 bonds. In addition to this there was a floating debt of $209,000.

The length of the road from Valparaiso, Ind., to Lansing, Mich., is 165 miles, and from Flint, Mich., to Port Huron is 67 miles, with a section of 45 miles from Lansing to Flint yet to be constructed.

New Orleans, Mobile & Texas.

New Orleans dispatches of recent date state that a compromise has been effected and that a new board of directors will be elected, in which Governor Sprague, of Rhode Island, and Messrs. Bushnell and White will represent the first-mortgage bondholders. The board of directors was to have met August 26 to ratify the agreement. As soon as this is done work will be recommenced on the Texas line.

Western Maryland.

The new track of this road from Owing's Mills to Baltimore is now completed. The length of this track is about 12 miles. The road makes connection with the Baltimore & Potomac in the western part of Baltimore, and comes into the city through the tunnel of that road. Heretofore it has used the track of the Northern Central from the Relay House to Baltimore. Owing's Mills, the point where the new track leaves the old road, is six miles west of the junction with the Northern Central, and the new track runs thence in a southwesterly direction.

Brunswick & Albany.

A report comes by way of Louisville that this road will be be bought at the coming sale (which is to take place in October) by the Central Railroad Company of Georgia. The original intention was to extend the road from Albany, Ga., westward to Eufaula, Ala., whence it was to be extended further west by an Alabama company, known as the Vicksburg & Brunswick. Some, if not all, of the grading between Albany and Eufaula was completed some time ago, and the Vicksburg & Brunswick road is in operation from Eufaula to Clayton, 20 miles. It is now reported that the Central Company will turn the Vicksburg & Brunswick road southwest toward Pensacola, and further that it will take up the iron from the Brunswick & Albany and cease to operate that road, the business of which is very small. These reports, however, rest on no known authority and must be received with caution.

Ashuelot.

A telegram from Keene, N. H., under date of August 21, says:

"At the adjourned term of the Supreme Court of this State, held at Concord, in the case in equity of the stockholders of the Ashuelot Railroad Company against John Henry Elliot, trustee of the mortgage bondholders of the road, brought for the purpose of redeeming the road and compelling Mr. Elliot to account for his management of it for the last twelve years, the Court decided for the plaintiffs. Mr. Elliot's defense against the claim was on the ground that the rights of the stockholders had been foreclosed by special act of the Legislature passed for that purpose; but the Court overruled that defense."

The road is 24 miles long and extends from the Cheshire Railroad at Keene, N. H., southwest to the Connecticut River road at South Vernon. It is operated by the Cheshire Railroad Company.

Portland & Oxford Central.

At the annual meeting of this company the stockholders voted that the directors be authorized to surrender the road to the bondholders, in satisfaction of the mortgage, whenever a majority of the bondholders shall request it. The road is 27½ miles long, from Mechanics' Falls, Me., on the Grand Trunk road, northward to Canton. The amount of the mortgage bonds is $218,500.

Detroit & Milwaukee.

The track of this road is being laid with steel rails. The steel is already laid from Birmingham to Pontiac, 11½ miles.

Montpelier & Wells River.

The tracklayers on the western end have reached a point 17 miles east of Montpelier, Vt. On the eastern end track is laid to Groton Village, 13 miles from Wells River and six miles beyond South Ryegate, the last point noted.

Ligonier Valley.

The work of grading on this road is progressing well, more than one half of it being done. It is expected that the road will be completed from Latrobe, which is on the Pennsylvania road, 41 miles east of Pittsburgh, southeast to Ligonier, about 12 miles, by the end of the year. The Pennsylvania Railroad Company has agreed to iron and equip the road as soon as the ties are down.

Texas & Pacific.

The *Nation's* money article last week said that besides the new issue of 6 per cent. construction gold bonds recently brought out by this company, there is another issue of bonds to the amount, it is believed, of $20,000,000, called the "first-mortgage land-grant 7 per cent. currency;" that there are plenty of them for sale in New York, and that they are the same in every respect as those issued by the railroad company to the construction company.

Buffalo, New York & Philadelphia.

This company, whose road has been completed and in operation for several months, offers at par its 10 per cent. bonds, the whole amount issued at the rate of $33,058 per mile of road, through its Treasurer and the various banks in Buffalo. The advertisement of the Treasurer does not specify that the issue is a new one or on different terms from a former issue, but we see elsewhere that the 10 per cent. bonds are secured by a second mortgage for $1,000,000, and are intended chiefly to provide equipment; there being a previous issue of $3,000,000 of first-mortgage bonds.

New Mail Routes.

The Post-office Department has ordered an extension of the postal service on the Milwaukee & Northern Railway, from Hilbert to Green Bay, Wis., 27 miles, and on the Omaha & Northwestern Railroad, from Blair to Herman, Nebraska, 10 miles.

Rockford, Rock Island & St. Louis.

This company's agent in Frankfort announces his readiness to pay the coupons of the converted bonds (7 per cents. changed to 3½ per cents.) due on the first of August, and also the yearly interest on the 4 per cent certificates of indebtedness which were issued in payment of over-due coupons. On announcement of this the price of the bonds rose from 26 to 28 in the Frankfort Market.

Missouri, Kansas & Texas.

Concerning the issue of bonds numbered above 2,500, which had been declared not a good delivery on the Amsterdam Exchange, Mr. Parsons, the President, explained that they were issued on the Holden & Paola and Sedalia & Moberly lines, and that their information concerning their issue and the property on which they were secured had been in possession of the committee of the Exchange for more than six months. This second issue amounts to $2 500,000, but very little of it was held in Holland, and even the bankers through whom the first loan was sold seemed unaware of its existence.

Kentucky & Great Eastern.

A correspondent in Maysville, Ky., writes that this company is vigorously pushing the construction of its road between Maysville and Portsmouth, having a large force at work, which is being constantly increased. It has already constructed a switch to the river, at which point it has collected a large amount of track material, and as soon as the bridges across Cabin and Bull creeks are completed, it will be enabled to extend the main track in both directions, so as to complete a ten-mile section; then it will be entitled to a part of the bonds subscribed by Mason County.

Covington, Flemingsburg & Pound Gap.

This company has been organized, and officers have been chosen and resolutions have been passed looking toward action. A correspondent writes that "the enterpise cannot possibly succeed, as there is no necessity for it, and the money for its construction must largely come from capitalists, as but comparatively a small portion could be raised along the line." The route would be nearly due southwest from Cincinnati, reaching a point 15 miles south of the Ohio at Flemingsburg, and the Virginia line at Pound Gap, 65 miles northeast of Cumberland Gap. The distance from Cincinnati to Pound Gap in a straight line is 170 miles.

Geneva & Ithaca.

An officer of the company gives us the following information in relation to this road, which is now nearly completed:

"The Geneva & Ithaca Railroad runs from Geneva, Ontario County, to Ithaca, Tompkins County. Its length is about 40 miles, gauge 4 ft. 8½ in., rail 56 lbs. It passes through the following places: (starting from Geneva) Romulusville, Ovid, Farmers' Village, Covert, Trumansburg, Taghkanic Falls, Ithaca.

"At Geneva it connects with the New York Central & Hudson River Railroad, and with the Geneva & Southwestern Railway, now building. At Ithaca its connections will be the Ithaca & Athens, Delaware, Lackawanna & Western, Ithaca & Cortland and Utica, Ithaca & Elmira.

The whole 40 miles is through a rich farming country with no line of railroad. The rails are laid for about 25 miles, and tracklaying is now going on at the rate of about a mile a day, and the trains are expected to meet at Romulusville about the 10th of September. Ballasting is following up the tracklayers. We expect to have the road open for traffic by 1st of October.

"The road is furnished with iron bridges from Clarke, Reeves & Co., Philadelphia; those over the Taghkanic Creek and Sheldrake and the Freemansburg Viaduct being fine specimens of work. The road promises well for local traffic, and with its advantages of connections with the Lehigh Valley and the Delaware, Lackawanna & Western, for eastern and southern points, will be available for the heavy shipments of the extensive nurseries at this point."

This road crosses diagonally the space (from 8 to 18 miles wide) between Seneca and Cayuga lakes, from the north end of the former to the south end of the latter. There is no other railroad between these lakes.